Renewable Energy Guideline on

Solar Photovoltaic (Small) Project Development in Malaysia

< 72 kWp

Implemented by:

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Imprint

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Kuala Lumpur, September 2016

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Disclaimers

RE-Guidelines for Solar Photovoltaics (small) project development in Malaysia are developed by Renewable Energy Support Programme for ASEAN (ASEAN-RESP), a jointly implemented project by ASEAN Centre for Energy *ACE) and GIZ. ASEAN-RESP is a regional project implemented on behalf of Federal Ministry for Economic Cooperation and Development (BMZ).

Highest effort has been given to ensure and maintain accuracy of the Guidelines. Regulations and procedures for RE project development in Malaysia are complex, include numerous actors and are likely to be changed or updated over time. It is therefore not possible to cover all aspects and eventualities of RE project development with these Guidelines. Highest efforts have been made to maintain the accuracy of existing processes however, GIZ and its implementing partners cannot be held responsible for any error and misuse of the Guidelines. The Guidelines shall not, in any case, replace or be used instead of existing laws, regulations and official guidelines issued by the relevant authorities in Malaysia.

Foreword

Ms. Catherine Ridu

Chief Executive Officer
SEDA Malaysia

Sustainable Energy Development Authority (SEDA) Malaysia

2011 was a transformative year for the development of renewable energy in Malaysia with the passing of the Renewable Energy Act [Act 725] and the Sustainable Energy Development Authority Act 2011 [Act 726]. This in turn ushered in the establishment of the Sustainable Energy Development Authority (SEDA) in Malaysia.

As a statutory body under the direct supervision of the Ministry of Energy, Green Technology and Water Malaysia, SEDA operates under 5 strategic thrusts as meted out in the National Renewable Energy Policy and Action Plan (2010) and is primarily responsible for sustaining the renewable energy agenda in the country. The core function of SEDA concerns the implementation of the Feed-in Tariff (FiT) mechanism as a means to foster growth in the nation's renewable energy (RE) market.

As Malaysia is equatorial in nature and thus receives an abundance of sunshine yearly, solar energy is positioned to play a crucial role in the future energy mix. As of July 2016, 9,406 applications out of a total of 9,586 approved applications were for solar PV alone, with 95% (8,989 applications) coming from applications for small installations of <72 kWp. The number of applications signifies the increasing awareness and acceptance from the general public of the importance of clean and renewable energy. With Net-metering and Large scale solar programmes announced for this year, it is expected that the number of solar power plants will continue to grow and contribute at an increasing rate in the coming years. While the target seems small at first glance, the market for solar energy has shown the most growth compared to other RE technologies, and it is the only technology where the public can participate as "prosumers" (both producer *and* consumer).

Foreword

In order for the PV market to grow, it is important to develop soft infrastructure such as human capital in order to support the PV industry. In this regard, SEDA is also responsible for providing a conducive environment to support the development of the PV industry by offering competency development training to members of the PV industry. SEDA also offers workshops and dialogue sessions to its stakeholders to ensure the transparency of the administrative procedures that uphold the good governance practiced in SEDA Malaysia.

As such, SEDA Malaysia supports the ASEAN Centre for Energy (ACE) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in their joint effort to develop this Renewable Energy Guideline on Solar Photovoltaic (Small) Development in Malaysia (<72 kWp).

As Malaysia is one of the active members supporting the ASEAN RE agenda, we hope that this guideline will deepen the talent pool regarding the development of large PV systems both in the country and around the ASEAN region. We sincerely hope this guideline will be of some benefit to all potential developers and investors in the development of solar PV projects in Malaysia.

Ms. Catherine Ridu,
Chief Executive Officer, SEDA

Foreword

Dr. Sanjayan Velautham

Executive Director
ASEAN Centre for Energy

Maria-José Poddey

Principal Advisor
ASEAN-RESP, GIZ

ASEAN Centre for Energy (ACE)

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Malaysia, as one of the front runners in terms of renewable energy (RE) technology implementation in ASEAN, aspires to achieve the targets set forth in the ASEAN Plan of Action for Energy Cooperation (APAEC) 2016 – 2025, i.e. 23 % share of RE by the year 2025 in ASEAN Energy Mix. In addition to promoting an increased share of RE in the total energy mix, Malaysia aims to reduce greenhouse gas emissions by 45% of the GDP until 2030, based on the levels of 2005.

Malaysia incorporated RE as early as 1980 with the introduction of Solar Photovoltaic System for rural electrification. After 21 years, RE was formally adapted in April 2001 under the Five Fuel Policy with the 8th Malaysia Plan. In 2011, Malaysia established the National Renewable Energy Policy and Action Plan (NREPAP), which enabled acts viz. Renewable Energy Act 2011 and the Sustainable Energy Development Act 2011. This resulted in the introduction of Feed-in Tariff (FiT) and other measures to promote the use of RE.

Successively, Malaysia introduced various financial incentives and strategies such as the FiT mechanism, Green Technology Financing Scheme (GTFS), Facilitation Fund from TERAJU, UKAS/PPCU and Pioneer Status/Investment Tax Allowance among others.

The Renewable Energy Support Programme for ASEAN (ASEAN-RESP) - a jointly implemented programme by the ASEAN Centre for Energy (ACE) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ) - is actively supporting ASEAN Member States (AMS) through various measures.

Foreword

These measures include capacity building, trainings and Focus Group Discussions with stakeholders and actors in the region and worldwide. One such activity is to streamline the procedures for permitting/approving projects in AMS. In this direction, the Sustainable Energy Development Authority (SEDA) of Malaysia and ASEAN-RESP have developed this *RE Guideline on Solar Photovoltaic (SPV) Project Development in Malaysia*. This guideline presents an overview of steps involved in the implementation of SPV projects.

The RE Guideline aims to document the existing permits and steps involved in the implementation of SPV projects in Malaysia in an easy-to-use and concise format. The Guideline provides an overview of the various steps involved and approvals required from concerned departments or authorities. The RE Guideline provides a means to improve, strengthen and further the development of SPV in Malaysia. The RE Guideline intends to support the deployment of Solar PV from presently installed capacity of 263.94 MW under FiT. Net Energy Metering (NEM). scheme allocates 100 MW and 250 MW per year for small SPV (2016-2020) and large SPV (2017-2020) respectively. This will result in total installed capacity addition of 500 MW and 1000 MW respectively. An overview of the procedures and steps involved will result in the increase of RE share in total energy mix, improved energy security, self-dependence on energy, as well as job creation in the ASEAN region.

We are grateful to the Ministry of Energy, Green Technology and Water (KeTTHA), Malaysia and SEDA for their insights and active engagement in the review and development of this Guideline. We hope that this publication will help increase the understanding of the various permits and procedures required for SPV project development in Malaysia, thus motivating various stakeholders to be involved in SPV projects.

Ms. Maria-José Poddey

Principal Advisor
ASEAN-RESP, GIZ

Dr. Sanjayan Velautham

Executive Director
ASEAN Centre for Energy

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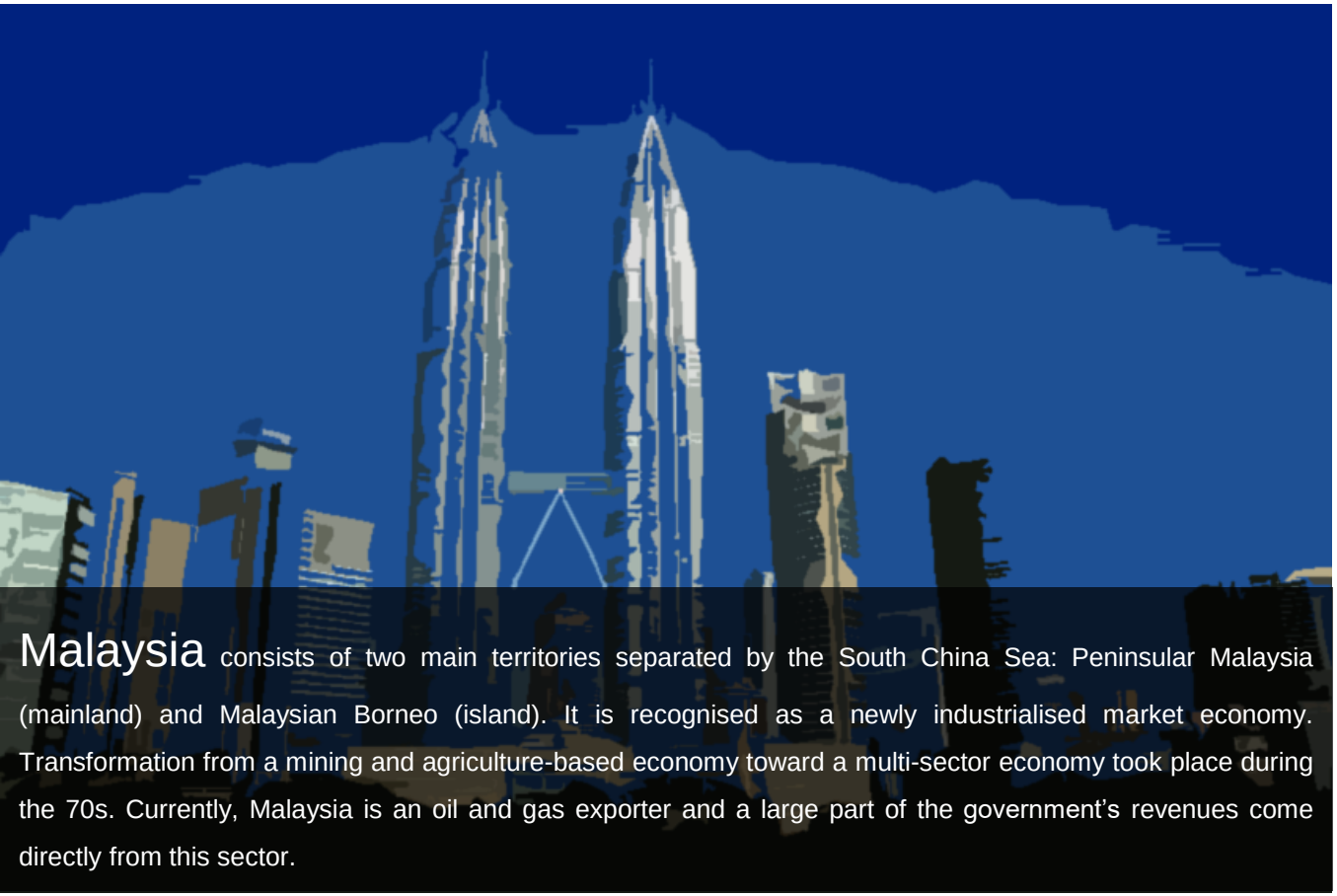


Malaysia consists of two main territories separated by the South China Sea: Peninsular Malaysia (mainland) and Malaysian Borneo (island). It is recognised as a newly industrialised market economy. Transformation from a mining and agriculture-based economy toward a multi-sector economy took place during the 70s. Currently, Malaysia is an oil and gas exporter and a large part of the government's revenues come directly from this sector.

Population (2016 estimation)

31.3 million [1]

Nominal GDP (2014 estimation)

USD 337 billion [2]

Nominal GDP per capita (2014 estimation)

USD 2,790 [2]

Capital

Kuala Lumpur

Currency

Malaysian Ringgit (RM)
(exchange rate: USD 1 = RM 4.21 - as of September 2015)

[1] Department of Statistics, Malaysia (2016); [2] International Monetary Fund (Oct 2014)

Solar Photovoltaic (PV) in Malaysia

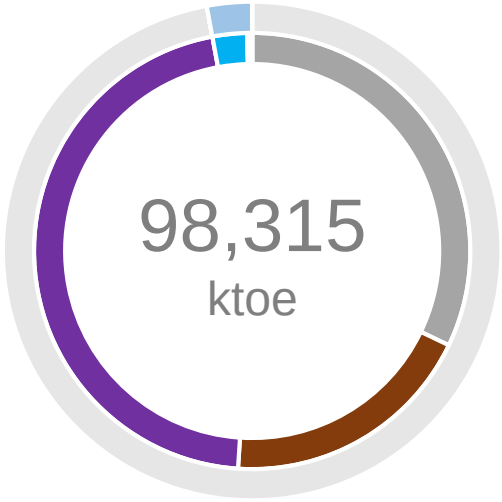
Background information

Malaysia possesses an abundance of energy resources, both conventional and renewable. Its primary energy demand was 98,315 ktoe in 2013. The share of conventional energy resources is very high at 97%, while Renewable Energy (RE) resources still play a very small role in the national energy mix. The installed capacity of Solar PV in Malaysia is 249.61 MW (June 2016).

Malaysia's National Energy Policy was established in 1979, consisting of three objectives: (1) securing a sufficient supply of energy in a cost-efficient manner, (2) promoting efficient use of energy, and (3) ensuring environmental protection in energy uses and productions. The Fuel Diversification Policy (1981 and 1999) was introduced to ensure the country is not overly dependant on a single source of energy. The four fuels initially defined include oil, natural gas, hydro and coal. The 8th Malaysia Plan 2001-2005 included RE as a fifth fuel, thereby adjusting the four fuel policy to five.

The Ministry of Energy, Green Technology, and Water (KeTTHA; *Kementerian Tenaga Teknologi Hijau dan Air*) is a governmental institution that oversees the Malaysia energy sector. The Energy Commission (ST; *Suruhanjaya Tenaga*) is a regulatory body mainly responsible for the natural gas sector and the power sector in Peninsular Malaysia and Sabah.

Primary energy mix (2013)[1]



3%	97%
Renewable	Conventional
Hydropower	Oil & Petroleum
Biomass / biofuel	Coal
	Natural gas

1: Total primary energy supply from Malaysia Energy Statistics Handbook 2015, www.seda.gov.my

ktoe: kilo tons of oil equivalent

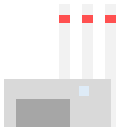
Solar Photovoltaic (PV) in Malaysia

Background information

The power market in Malaysia is generally monopolistic in nature with three main vertically integrated power utilities responsible in three different areas.

- Tenaga Nasional Berhad (TNB) in Malaysia Peninsular
- Sabah Electricity Limited (SESB) in Sabah
- Sarawak Electricity Company (SESCO) in Sarawak

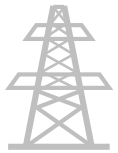
The Electricity Supply Act (Act 447) was passed in 1990, establishing a framework for the private sector to participate in the generation of power as an independent power producer (IPP); the act was later amended in 2001. The Ministry of Energy, Green Technology, and Water issued several regulations under the Act 447. The important regulations are Electricity Regulation (firstly issued in 1994 and later amended two times in 2013 and 2014), and Licensee Supply Regulation (issued in 1990).



Generation

29.8 GW
(18 GW from IPP)

134,077 GWh



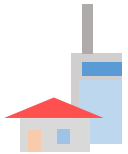
Transmission

24,535 kmc
(66 kV, 132 kV, 275 kV, and 500 kV)

Distribution

1,432,936 kmc
(below 66 kV, overhead lines and underground cables)

Consumption



9 million customers
(grid-connected)

116,353 GWh

Note: Unless stated otherwise, data are taken from 2012.
Source: Malaysia Energy Statistics Handbook 2014

Solar Photovoltaic (PV) in Malaysia

Background information

The potential to harness solar PV in Malaysia remains high year-round. Plenty of solar PV sites can be found throughout Peninsular Malaysia, Sabah and Sarawak. As of 2016, there are a total of 8,606 solar PV systems in the Feed-in Tariff programme under Sustainability Energy Development Authority (SEDA) Malaysia [1].

As of 2016, the installed capacity of commissioned solar PV plants under the Feed-in tariff scheme is 256.5 MW, resulting in power generation of around 45.12 GWh in 2016 [2]. Most solar PV sites are located in the eastern part of Malaysia.

An effort to promote RE in Malaysia was initiated by the government in the past. The concept and idea of a Feed-in Tariff (FiT) was first proposed by Malaysia Building Integrated Photovoltaic (MBIPV note 1) Project as a potential policy to promote Malaysia's RE Sector in 2004. Following several extensive studies, consultation workshops and joint co-operation with international partners, invested parties sought to tailor the policy and supporting mechanisms to best fit Malaysia's needs.

[1]: FiAH Listing (www.seda.gov.my); [2]: Operational Plants (www.seda.gov.my)

Note 1: Malaysia Building Integrated Photovoltaic (MBIPV) Project was a joint initiative between the Government of Malaysia, the United Nations Development Program (UNDP) and Global Environment Facility to promote a nationwide and sustainable solar PV market in Malaysia. MBIPV was active from 2006 to 2010.

Solar Photovoltaic (PV) in Malaysia

Background information

The National Renewable Energy Policy and Action Plan (NREPAP) was proposed in 2009 and adopted in April 2010. The NREPAP consists of five objectives:

- To increase RE portion in the national energy mix
- To facilitate growth of RE sector
- To ensure reasonable cost of RE
- To conserve and protect the environment
- To enhance awareness on RE

Not long after, FIT was incorporated into the 10th Malaysia Plan in June 2010 and later into the National Budget of 2011. The RE sector gained a strong foothold in 2011 when the Renewable Energy Act (Act 725) was passed. It sets the framework for RE project development under the FiT scheme. The Sustainable Energy Development Authority (SEDA) was also established by the SEDA Act (Act 726) concurrently. SEDA is a special regulatory body under the Ministry of Energy, Green Technology, and Water that administrates and manages the implementation of the FiT mechanism under the RE Act.

Solar Photovoltaic (PV) in Malaysia

Background information

The feed-in tariff for a solar PV project is between 23 sen and 24 sen (US¢ 5.4 to 5.7), depending on the installed capacity. The FiT duration is 21 years. There is a digression rate (15%) for the solar PV plant.

Installed capacity	FIT rate (per kWh)
Up to 4 kW	84.29 sen (US¢ 20.02)
Above 4 kW and up to 24 kW	80.48 sen (US¢ 19.12)
Above 24 kW and up to 72 kW	61.39 sen (US¢ 14.58)

About the Guidelines

Small Solar PV Project Development in Malaysia

In recent years, ASEAN Member States (AMS) have made a considerable effort to tap into the vast reserves of renewable energy (RE) in the region. Several countries introduced feed-in-tariffs (FIT) or regulations for RE, as well as other supportive policies, for example tax and customs exemptions or tax holidays.

Despite those efforts and some promising developments, a large scale market for RE applications has not yet been established in the region. In particular, complex administrative procedures, a lack of transparency in the project cycle and permitting procedures as well as insufficient access to financial resources are but some of the obstacles preventing an effective market and satisfactory industry development.

The ASEAN RE Guidelines were developed to facilitate increased private sector activity and investment in the RE sector of the ASEAN region. Since the confidence of project developers and investors is a prerequisite to boost region-wide RE deployment, the provision of transparent project development and permit procedures is indispensable.

To this end, the Renewable Energy Support Programme for ASEAN (ASEAN-RESP), jointly implemented by the ASEAN Centre for Energy (ACE) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, is devleoping a comprehensive, easy-to-access and regularly updated online tool which includes complete information on ideal RE project development cycles in the respective AMS. The ASEAN RE Guidelines:

- highlight administrative procedures including requirements for project developers and/or investors;
- list legal and regulatory provisions as well as necessary permits;
- identify country-specific challenges for project development; and
- Provide information on how to obtain financial closure.

The ASEAN RE Guidelines are designed as best as possible to meet the needs of project developers and potential investors, as well as promote transparency and clarity in the RE projects' pathway. The Guidelines explain in detail the various procedures and help identify the risks associated with each step so that proper mitigation measures can be designed and put in place.

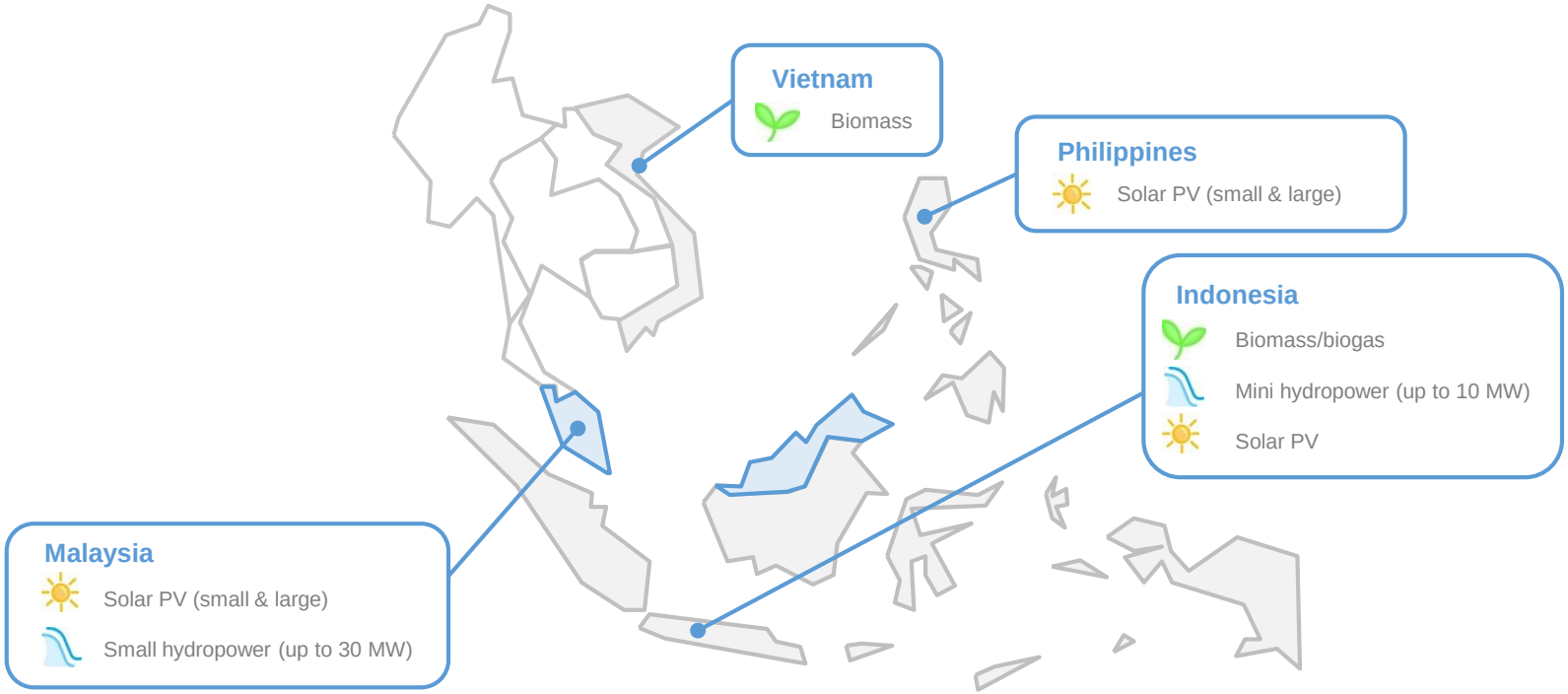
About the Guidelines

Small Solar PV Project Development in Malaysia

ASEAN RE Guidelines | This Guideline

The ASEAN RE Guidelines were developed for different technologies and several ASEAN Member States. To promote RE development, as a precondition a clear legal framework must exist, along with minimum market readiness. The ASEAN-RESP is working closely with relevant organisations and projects in the respective member states in order to ensure quality, completeness and accuracy of data.

A series of four ASEAN RE Guidelines have been developed and published in four ASEAN Member States: Indonesia, Malaysia, the Philippines, and Vietnam.



About the Guidelines

Small Solar PV Project Development in Malaysia

This guideline, which is one of three publications in the ASEAN RE Guidelines initiative, focuses on small Solar Photovoltaic development. The other guidebooks in this series are (1) large Solar PV project development and (2) small Hydropower project development, scheduled to be published simultaneously.

The Renewable Energy Support Programme for ASEAN (ASEAN-RESP) identified regional and international consultants for the development of the RE Guidelines. This guideline **"Solar Photovoltaic (Small) Project Development in Malaysia"** was developed jointly with regional consultant SSM Associates Sdn Bhd in close co-operation with Sustainable Energy Development Authority (SEDA) Malaysia. The guidelines were reviewed by international consultants Eclareon GmbH and E.Quadrat GmbH to ensure that the information and content which are local in nature can be easily accessible and understood by foreign investors/ developers.

The primary target group of the guideline include project developers and investors who are investigating the feasibility of pursuing a solar PV project in Malaysia. It is also useful for bankers and policy makers. The objective of the guidelines is to provide an overview of processes, and they are not written from the perspective of engineering, procurement, and construction (EPC), engineering consultant, or equipment suppliers.

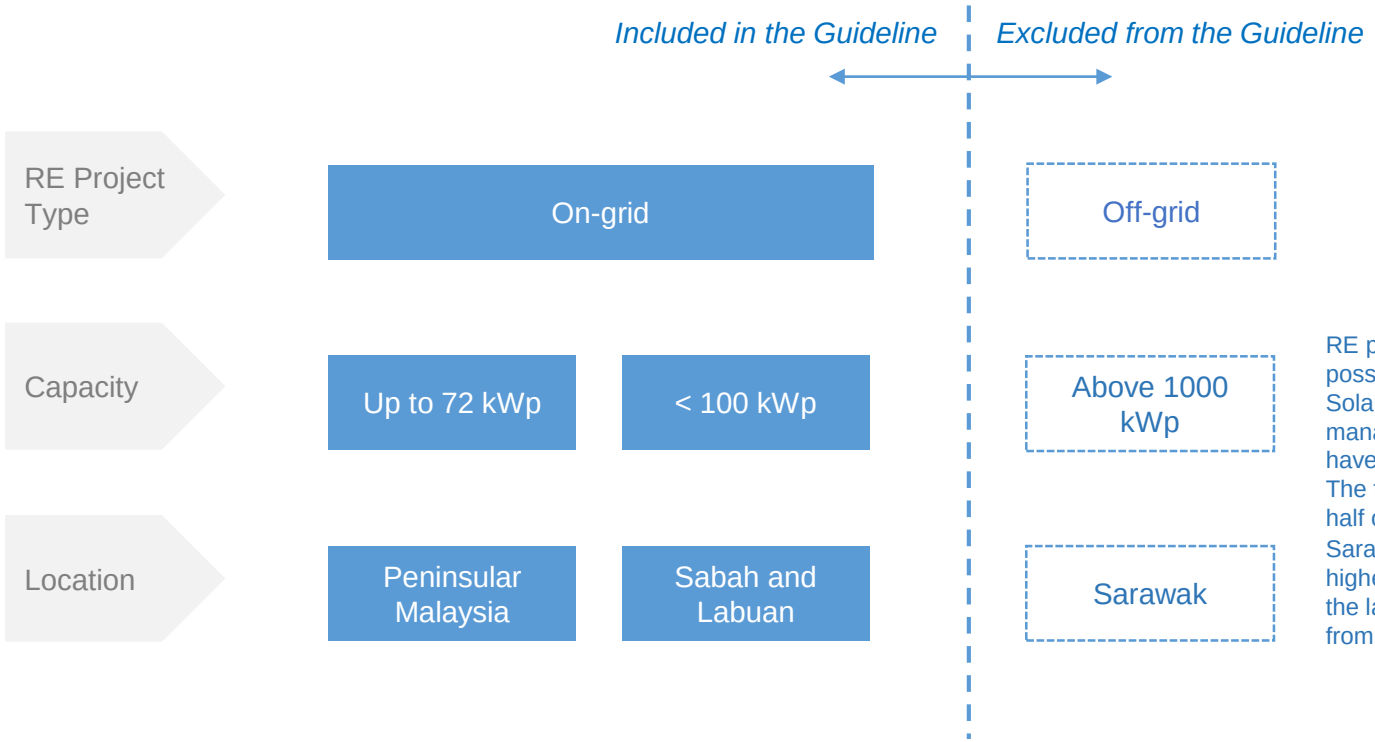
This guideline covers only grid-connected small Solar PV projects with a capacity smaller than 72 kWp. Development of an off-grid project is subject to different procedures and technical details. The procedure outlined is for projects that wish to obtain a FiT as provided by the Renewable Energy Act 2011 Malaysia.

Based on the regulatory framework and different governing system, development of a small Solar PV project in Sarawak needs to adhere to different laws and regulations; the procedures are also different. This guidebook covers the legal and regulatory framework in Peninsular Malaysia or Sabah only.

About the Guidelines

Small Solar PV Project Development in Malaysia

ASEAN RE Guidelines | This Guideline



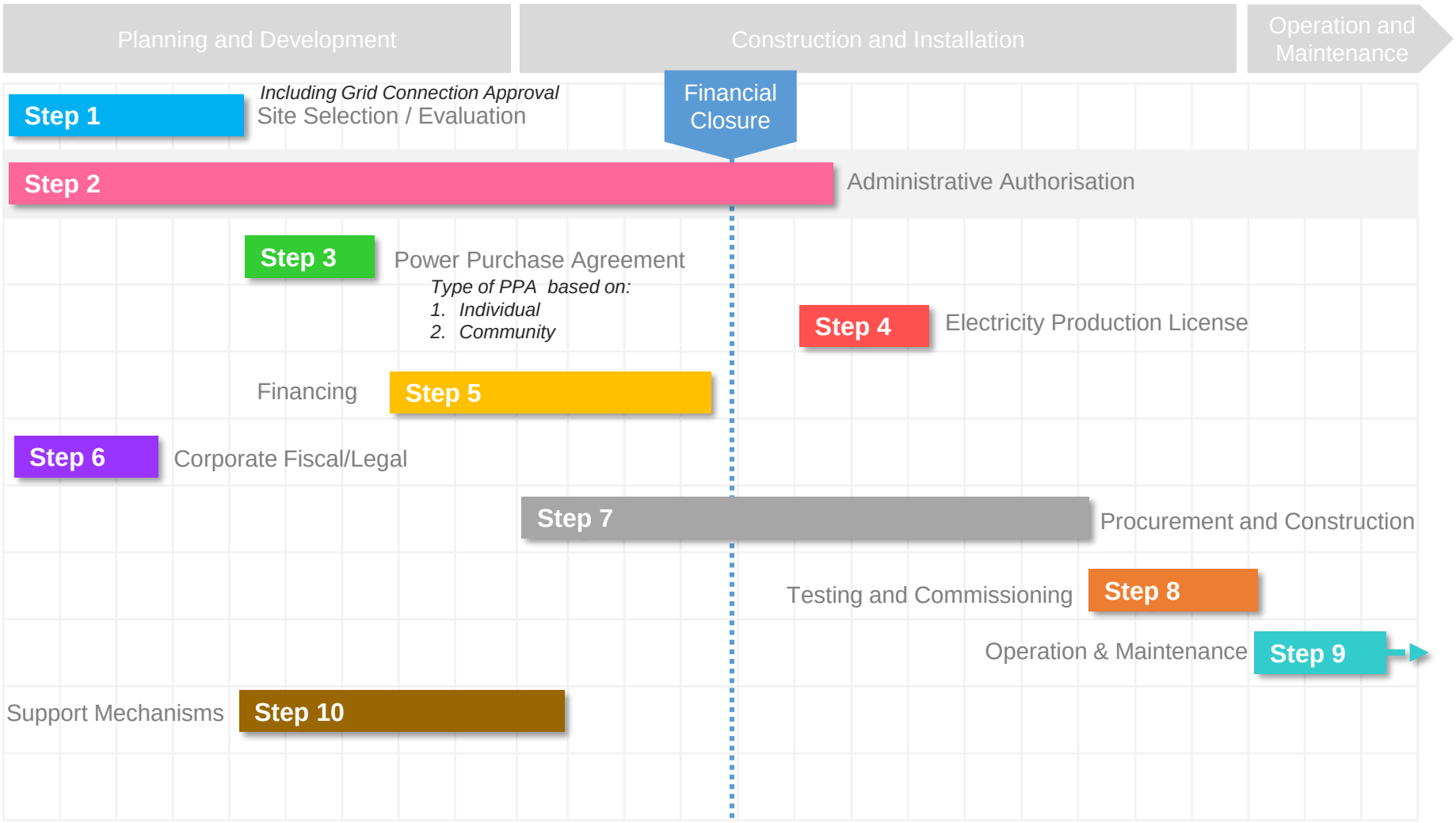
RE projects larger than 1000 kWp are possible but fall under the Utility Scale Solar PV (USSPV) programme managed by Energy Commissioner and have to go through a bidding process. The first bidding process is in the 2nd half of 2016.

Sarawak is a state in Malaysia with a higher level of autonomy. Therefore, the laws and regulations are different from the federal ones.

Procedures: Step-by-Step

Small Solar PV Project Development in Malaysia – for individual 24 kW and Community 48 kW

Gantt's Chart | Flow Chart | Description

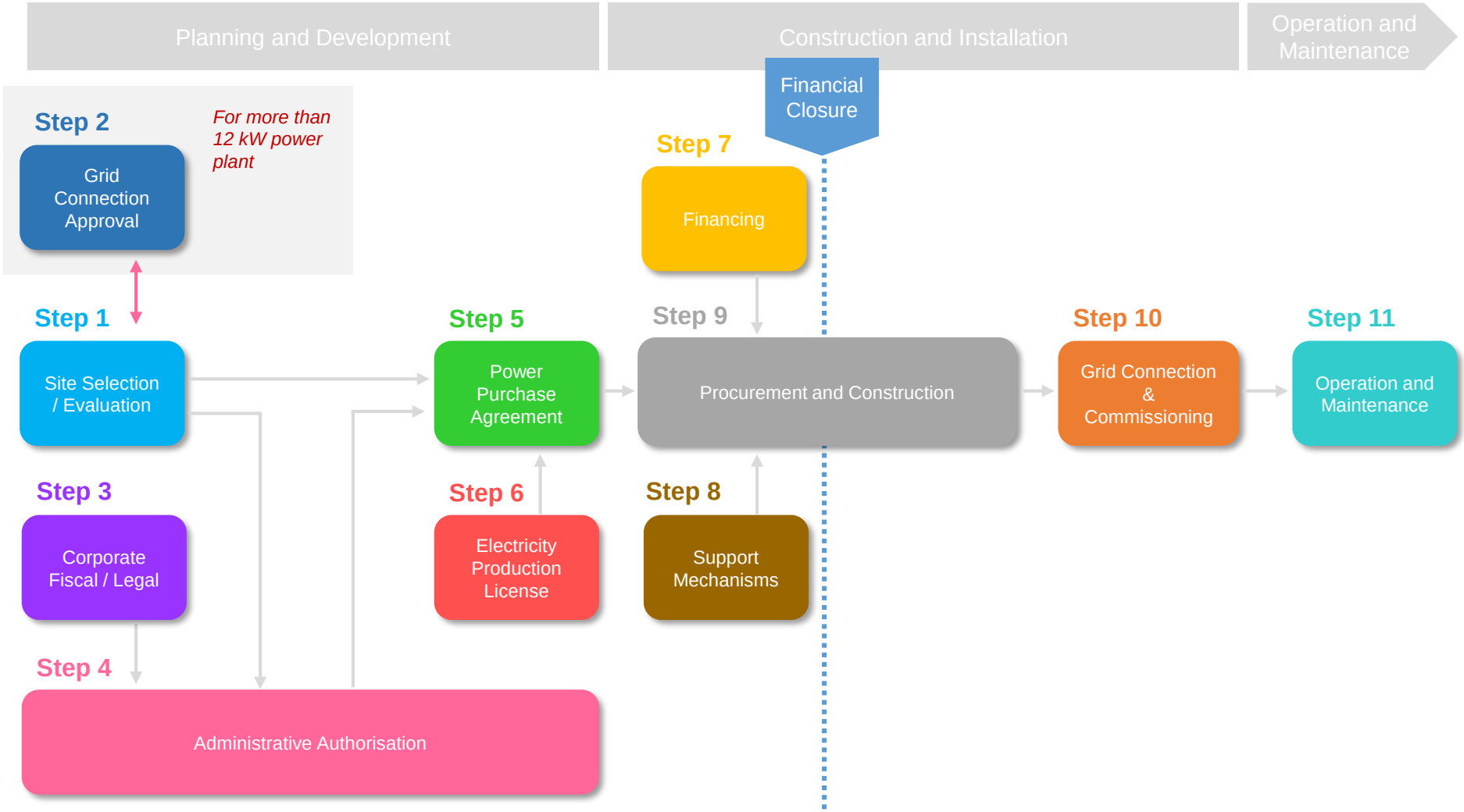


Note: The bar length on the Gantt's chart is not to scale. It should be used for qualitative comparison only.

Procedures: Step-by-Step

Small Solar PV Project Development in Malaysia – for individual 24 kW and Community 48 kW

Gantt's Chart | **Flow Chart** | Description



Procedures: Step-by-Step

Small Solar PV Project Development in Malaysia – for individual 24 kW and Community 48 kW

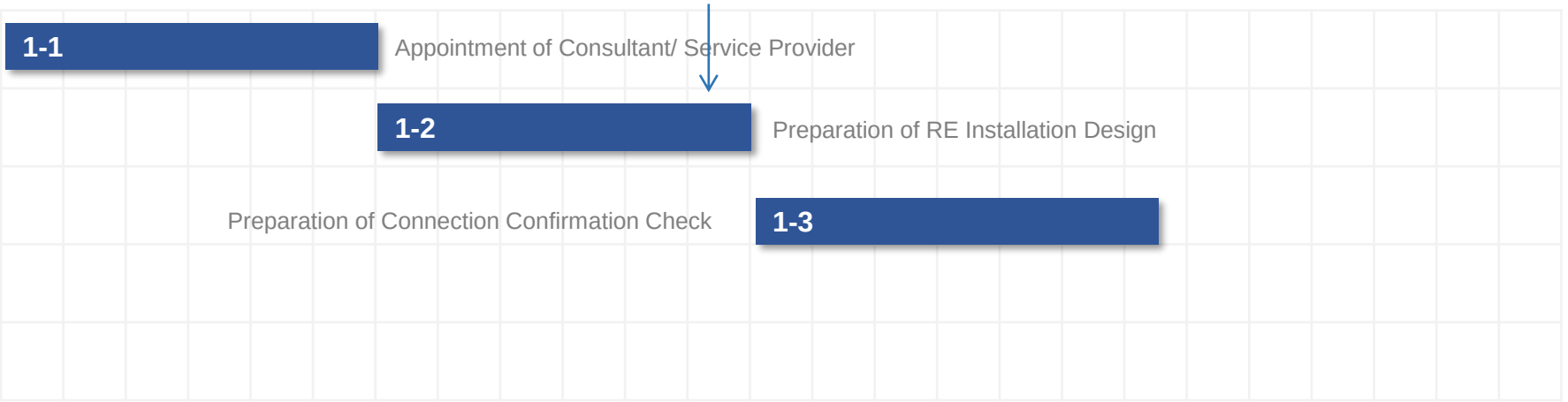
- To develop a small Solar PV project in Malaysia, project developers must first identify and select a suitable site for building a small Solar PV plant.
- At the same time, permission for grid connection must be obtained.
- Typically, project developers establish a special purpose company (SPC) to develop, construct and operate a small Solar PV plant. The establishment of such a company must be done from the outset.
- Several permits must be obtained from the government and relevant authorities.
- A provisional license must be obtained from the Energy Commission, allowing a project developer to generate electricity in Malaysia.
- Financing must be secured from banks or financial institutions.
- After the financial closure, procurement and construction may then proceed.
- After completion of small Solar PV power plant construction, inspection and testing must be conducted.
- After COD, the small Solar PV plant may begin operating.

2-1 Power System Study (PSS)

2-2 Connection Confirmation Check (CCC)

Gantt's Chart | Flow Chart | More Details…

Step 1 | Site Selection / Evaluation



Conditional sub-step

Mandatory sub-step

Gantt's Chart | Flow Chart | More Details…

2-1 Power System Study (PSS)

2-2 Connection Confirmation Check (CCC)

Step 1 | Site Selection / Evaluation

Step 1 | Site Selection / Evaluation

… Gantt's / Flow Chart

Step Description

The first step for project developers is to select a suitable location for small Solar PV project development. For Solar PV project development, the project site should have good solar insolation with sufficient sunny days (no clouds/rain) throughout the year to best ensure success. Choosing a site known to receive a reliable supply of energy serves to ensure the business venture remains economically viable.

According to the regulatory framework in Malaysia, engineering-related studies for chosen sites must be conducted only by a registered professional engineer (PE). In case the project developer is not qualified or lacks sufficient capability to conduct the site selection and evaluation, an external consultant must be contracted to assist in this step (Sub-step 1-1).

The contracted professional engineer will assist the project developer in preparing RE Installation Design (Sub-step 1-2). Also of note, a Sub-step 3 Connection Confirmation Check must be conducted accordingly.

Appointment of Consultant/Service Provider

DESCRIPTION

Appointment of Consultant/Service Provider

The appointment of a technical consultant/service provider is required in order to conduct the Feasibility Study and assist the developer/client in all related work prior to the submission of the renewable energy scheme application to the Sustainability Energy Development Authority (SEDA), as well as to assist in the preparation of the Power Purchase Agreement (PPA). A technical consultant is also needed throughout the implementation stages. These stages include detailed design, tendering work, supply of equipment and installation of the facility along with testing and commissioning.

A consultant/service provider is identified and hired through Letter of Appointment.

RELATED AUTHORITIES

Federal level	▪ Sustainable Energy Development Agency (SEDA)[1] – Review and evaluate the FS
State government	-
Local government	-

Appointment of Consultant/Service Provider

DESCRIPTION

These stages include the detailed design, the tendering of work, the local authority's code of compliances, the supply and installation of the facility equipment as well as the testing and commissioning.

This sub-step covers an interaction between two businesses. There is no regulatory body governing the exact procedure. Typically, the applied procedure to appoint a technical consultant could be as follows:

- The project developer requests proposals from one or more potential consultants. A request for a proposal (RFP) must be prepared (see documents).
- Consultants submit their proposals. Typically, a proposal from the potential consultant consists of:
  - The technical proposal – covering the scope and duties to be carried out by the consultant
  - The financial proposal – indicating the service cost and reimbursable costs
- The project developer evaluates and compares the received proposals. A face-to-face meet may be arranged, allowing for detailed negotiation on the scope of work, deliverables, timeframe, service costs, terms and conditions, etc.
- The developer makes a decision and notifies the winning consultant through a letter of appointment. The contract must be signed.

Appointment of Consultant/Service Provider

REQUIRED DOCUMENTS

The technical consultant/service provider is required to provide the following documents:

- Technical proposal
  Scope and duties
- Financial proposal
  Professional fee and reimbursable out-of-pocket costs

Appointment of Consultant/Service Provider

$RM FEES / COST

- The fee for Feasibility Study will be mentioned in Sub-step 1-2. The professional fee for post-PPA activities ranges from **1.5% to 2.5%** of the capital expenditure (CAPEX)

DURATION

- As this sub-step is an interaction between the developer and the consultant, there is no specific timeframe for finalising the contract.

  However, finalising the contract as soon as possible serves to keep project costs under check and avoid unnecessary cost escalation due to any unforeseen issues that may arise.

Appointment of Consultant/Service Provider

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Act No. 138 Year 1967	Registration of Engineer Act 1967 This act describes the role of Professional Engineer. According to this act, the feasibility study (FS) is considered “Professional engineering services” and must be performed by a registered professional engineer only.

Appointment of Consultant/Service Provider

REFERENCE DOCUMENTS / SOURCES

Document name	Description
SEDA Guidelines	Guidelines and Determination of the Sustainable Energy Development Authority, Malaysia This guideline can be downloaded from the official SEDA website.

Appointment of Consultant/Service Provider

CHALLENGES AND RISKS

Risk	Details
Poor consultation services	Engaging inexperienced consultants can lead to poor implementation of the scheme and improper project planning.
Poor suppliers	Unscrupulous suppliers and contractors may try to undermine the authority of and working arrangement with the consultant. The developer must therefore provide a clear scope of work and deliverables to the consultant and properly define their relationship with the suppliers and contractors. Regular checks must be conducted to properly maintain the quality of work and timely implementation of deliverables/activities. This is to ensure the implementation of the scheme is carried out in a professional manner.

Preparation of RE Installation Design

DESCRIPTION

This sub-step outlines the process for conducting a feasibility study (FS) for the project. This must be done by the contracted consultant (Sub-step 1-1). The FS is to be carried out to determine whether the development of a large scale Solar PV project is technically feasible and economically viable. The FS must be submitted as part of the RE application to the Sustainable Energy Development Agency (SEDA), Malaysia.

Typically, a preliminary survey at the site must be performed in this sub-step as well. This is to ensure that the actual site's condition is suitable for the feasibility study and ensuing project development.

The scope of the preliminary survey should cover the following aspects of small Solar PV plant development:

- Desktop study – desktop study to assess the requirement(s) for a small solar PV plant and related criteria
- A site survey of the proposed location and interconnection point
- A thorough technical and financial analysis to ensure the success of the plant

RELATED AUTHORITIES

Federal level	-
State government	-
Local government	-

Note 1: The submission of the FS to SEDA is done during the Feed-in approval holder (FiAH) application (described in Sub-step 2-2)

Preparation of RE Installation Design

REFERENCE DOCUMENTS / SOURCES

Technical Analysis

The technical analysis of FS should consist of the following as a minimum requirement:

- Project description, location, interconnection point
  A brief description of the project objective and intended output
- Solar irradiation availability of proposed project site
  i.e. insolation, clouds, shadow, etc..
- Geology and geotechnical assessment of the project site
  Impact on the operation of the project and end user
- Power and energy determinations
  Installed capacity (kW) and estimated power generation (MWh) from the proposed project
- Conceptual design and work programme
  Solar array, inverter, switchgear, transformer, layout interconnection
- Technical drawings, SLD diagram, etc.

Economic Analysis

The economic analysis as an important part of FS should consist of the following:

- Preliminary cost-economic analysis, methodology and approaches
- Cash flow calculation
- Internal rate of return (IRR) analysis
- Payback period calculation
- Debt service coverage ratio (DSCR) calculation

Preparation of RE Installation Design

FEES / COST

- The service cost for FS preparation and finalisation (including associated preliminary site survey) depends on the proposed project location, project size, etc.

  Typical range:

Lower end	RM 5,000
Higher end	RM 20,000

DURATION

- Finalisation of the FS may take around **1 - 3 months**. However, the duration of the Feasibility Study namely depends on various factors such as project size, technology opted, location, social factors, etc.

Preparation of RE Installation Design

CHALLENGES AND RISKS

Risk	Details
Poor Feasibility Study	Incomplete data and inexperienced consultants can lead to a poorly prepared FS and may subsequently result in the proposal's refusal by banks.
Change of PSS	Delays in completing the FS report due to unforeseen changes may result in the delay of the Power System Study (PSS). In such instances where there is a need to engage a PSS consultant early on, said consultant will assist in finding solutions to any challenges that may arise, e.g., power evacuation so as to complete the FS in a timely manner.

Preparation of Connection Confirmation Check (CCC)

DESCRIPTION

Connection Confirmation Check (CCC) is an assessment to determine the optimal and technically feasible method for the proposed connection of a low to medium voltage RE (Solar) installation to a utility connection point.

The following procedure may be followed for Connection Confirmation Check:

- Submit application to RE TNB
- RE TNB to receive documents submitted
- In found complete, RE TNB issues payment order to the developer to pay the requisite application fee
- Developer is required to submit proof of payment made to RE TNB

RELATED AUTHORITIES

Federal level	-
State government	-
Local government	-

Preparation of Connection Confirmation Check (CCC)

REQUIRED DOCUMENTS

The following is a list of documents to be submitted:

- CCC application form
- Annexure 4.1.2 (SEDA)
- Single Line Diagram (SLD)
  i. Solar system scheme/drawing and capacity
  ii. Overall (electrical) single line diagram
  iii. Proposed interconnection scheme
  iv. SLD of existing electrical supply to building
- Site layout plan
- Solar Panel Datasheet
- Inverter Datasheet

Preparation of Connection Confirmation Check (CCC)

FEES / COST

Fee charged for a system between 12 kW to 180 kW	RM 1000

DURATION

- Conducting a Connection Confirmation Check (CCC) usually takes around **1 month**.

Note: The cost and duration data are based on market survey and an interview with project developer.

Preparation of Connection Confirmation Check (CCC)

RELATED LAWS AND REGULATIONS

Regulation No.	Name
Legal Reference: **PU (A) 120 RE**	Electricity Supply Act 1990 P. U. (A) 120 RE (Technical and Operational Requirements) Rules 2014 of RE Act 2011 (Act)
Official Reference:	TNB Transmission Grid Code TNB Distribution Grid Code TNB Technical Guidebook for the Inter-connection of Generation of Distribution Network

Preparation of Connection Confirmation Check (CCC)

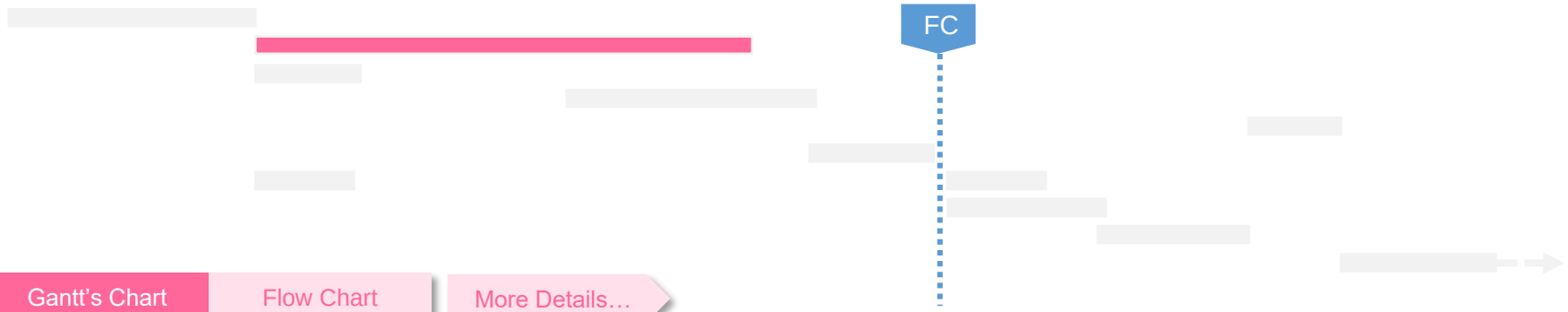
REFERENCE DOCUMENTS / SOURCES

Document name	Description
Peninsular Malaysia Grid Code	The document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html
Labuan and Sabah Grid Code	This document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html
Distribution Code	This document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html
TNB Interconnection Guidebook	"Technical Guidebook for the Connection of Generation to the Distribution Network" is published by TNB Research Sdn. Bhd. It is to be used by distributed generation (DG) developers, plant managers or engineers, technical consultants and engineers of power utility. The document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html. The latest guidebook is the first edition (published in March 2005)

Preparation of Connection Confirmation Check (CCC)

CHALLENGES AND RISKS

Challenges	Recommendation
Large number of applications received by TNB	A large number of applications received may result in delays. To ensure the project is approved on time, submitting an application to TNB early is advised.

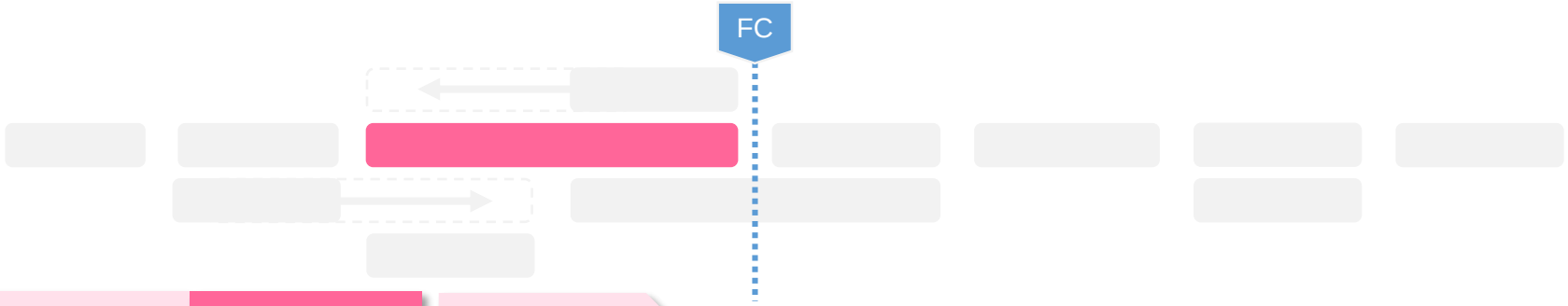


Gantt's Chart | Flow Chart | More Details…

Step 2 | Administrative Authorisation

2-1 Applying for Feed-in Account Holder

● Mandatory sub-step



Step 2 | Administrative Authorisation

2-1

Application for Feed-in-Account Holder

Step 2 | Administrative Authorisation

… Gantt's / Flow Chart

Step Description

This sub-step is on how to obtain a Feed-in-Account. An individual who is a citizen of Malaysia or a registered society, co-operative or company in which the majority shareholder is Malaysian may apply for a Feed-in Approval certificate. The approved Feed-in certificate can be obtained from SEDA. This step describes the required formalities and documents for a Feed-in Account Holder (FiAH).

Application for Feed-in-Account Holder (FiAH)

DESCRIPTION

This sub-step is on how to obtain a Feed-in-Account. An individual who is a citizen of Malaysia or a registered society, co-operative or company in which the majority shareholder is Malaysian may apply for a Feed-in Approval certificate. The approved Feed-in certificate can be obtained from SEDA.

To obtain a Feed-in-Account one may apply for one online by providing the required information as well as submitting a hard copy of the filled out form. Required fees must be paid when submitting the application form.

Valid proof of payment of FiAH certificate fees can be obtained from SEDA, provided the application has been approved.

The final decision on approval is subject to available quota for FiT.

Holder of Feed-in certificate is eligible to sell Renewable Energy at the Feed-in-Tariff (FiT) rate as stipulated by SEDA as set out in RE Act 2011.

RELATED AUTHORITIES

Federal level	▪ Sustainable Energy Development Authority (SEDA), Malaysia
State level	▪ (none)
Local Level	▪ (none)

Application for Feed-in-Account Holder (FiAH)

DESCRIPTION

To obtain FiAH please note the following procedures:

1. Check the available quota and commissioning period
2. Interested companies to save their Feed-in Application (FiA) drafts via e-FiT
3. Companies who have completed 100% of their draft application will qualify for the balloting process
4. Preparation and listing of completed drafts from e-FiT for balloting exercise
5. Balloting for queue numbers
6. Total queue numbers awarded will depend on total installed capacity of applications
7. Companies allotted a queue number will be required to attend a session in SEDA Malaysia's office (Putrajaya) to submit their Feed-in Application Online

RELATED AUTHORITIES

Application for Feed-in-Account Holder (FiAH)

REQUIRED DOCUMENTS

- **Profile Registration Document (in case the applicant is a company)**

The latest audited accounts of the applicant

The memorandum and articles of association of the Applicant

Form 8 (Certificate of Incorporation of Public Company) or

Form 9 (Certificate of Incorporation of Private Company) in connection with the Applicant under the Companies Act 1965

All Forms 24 (Return of Allotment of Shares) lodged by the applicant with the Registrar of Companies under the Companies Act 1965

The latest Form 49 (Return giving particulars in Register of Directors, Managers and Secretaries and change of particulars) lodged by the applicant with the Registrar of Companies and a written confirmation from the company's secretary on the current shareholding of the applicant

A Share-holding/Ownership Structure Diagram; detailing the shareholding percentages of each ultimate shareholder in the company

Copy of the MyKad of each individual shareholder in the company; or, a certified copy of Form 24 and 49 of each shareholder (if the shareholder is a company) by the company's secretary and a confirmation letter from the company's secretary confirming the list of shareholders

Certified copies of Forms 24 and 49 of the company(ies) where each ultimate shareholder has a shareholding percentage (direct or indirect)

An extract of the company's board resolution authorising the applying person to make present an application on behalf of the applicant and to execute and submit all documents in relation thereto

The developer must check with the EPU office in the respective state for the exact list.

Application for Feed-in-Account Holder (FiAH)

REQUIRED DOCUMENTS

- **Profile Registration Document (in case the applicant is a corporate body)**

A copy of the certificate from the appropriate authority certifying that the body has been duly constituted under said written law; and

The relevant minutes of proceedings of a meeting of the body corporate or of a committee duly signed by the chairman of the meeting, authorising the representative to make this application on behalf of the body corporate and to execute and submit all documentation in relation thereto

- **Profile Registration Document (in case the applicant is a registered society)**

A copy of the certificate of registration (Form 3) issued by the Registrar of Societies under section 8 of the Societies Act 1966;

Certified true copy of the relevant minutes of a meeting of the society duly signed by the Chairman of the meeting and at least 2 other office bearers of the society authorising the representative to apply for FiT on behalf of the society and to execute & submit all documentation in relation thereto

- **Profile Registration Document (in case the applicant is a co-operative society)**

A copy of the certificate of registration issued by the Malaysia Co-operative Societies Commission; and

The extract of the co-operative society's board resolution authorising the representative to make this application on behalf of the co-operative society and to execute and submit all documentation in relation thereto

Note: The exact list of required documents can be different from state-to-state. The list provided in this guidebook is only typical documents usually requested by state EPU office. The developer must check with the EPU office in the respective state for the exact list.

Application for Feed-in-Account Holder (FiAH)

REQUIRED DOCUMENTS

- **Profile Registration Document (in case the applicant is a Firm)**

A certificate of registration (Form D) of the firm issued by the Registrar of Businesses; or the letter or certificate relating to the constitution of the firm from bodies regulating the profession in which the firm is practicing in

The relevant minutes of proceedings of a meeting of the firm duly signed by the chairman of the meeting (who must be a partner of the firm), authorising the representative to make this application on behalf of the firm and to execute and submit all documentation in relation thereto

- **Profile of the applicant together with CVs of the Project management team**
- **Submit hard copy of the Feed-in-Approval application form and following supporting documents:**

Application Form (hard copy)

Declaration Form

Summary of the application according to template form SEDA

Detailed engineering design of the renewable energy installation, including all relevant calculations to justify the installed capacity and claimed efficiencies, proposed plant layout and AC single line diagram certified by Professional Engineer (PE) and all supporting documents justifying bonuses applied for

Application for Feed-in-Account Holder (FiAH)

REQUIRED DOCUMENTS

- The power system study (PSS) Sub-step 1-X, report and letter of approval from the Distribution License (DL);
- The list of Feed-in Approval (FiA) currently or previously held by the Applicant, if any
- Documents proving the Applicant's ownership of the site
- Land title (all pages) and site map
- A certificate in solar photovoltaic system design registered with the Authority
- A certificate of registration of each Qualified Person with the Board of Engineers Malaysia as a Professional Engineer (Electrical)
- A copy of the quotation(s) from the EPC/SP showing the total capital cost of the Renewable Energy Installation
- Bankers Cheque/ Cash Order (RM100/kW)
- EPC track record – Agreement or contract of appointment as EPC

Note: The exact list of required documents can be different from state-to-state. The list provided in this guidebook is only typical documents usually requested by state EPU office. The developer must check with the EPU office in the respective state for the exact list.

Application for Feed-in-Account Holder (FiAH)

REQUIRED DOCUMENTS

- **Projects requiring loans from bank/s or financiers/s to provide the following documents:**

Financing agreements with the entity(ies) that will be or has/have provided financing to the Applicant for the project; or

The letter(s) of intent/offer letter(s)/financing term sheet(s) from the entity(ies) that will be or has/have provided financing to the Applicant for the project

Application for Feed-in-Account Holder (FiAH)

$ RM FEES / COST

- The processing fee is decided by SEDA and must be paid to SEDA Malaysia

Processing Fee for each submission	RM 1000

DURATION

- Typically, time taken for the FiAH depends on the completeness of documents and as advised by SEDA

Note: Indicated fee in USD is only approximate based on the currency conversion of USD 1 = PHP 3.27 (as of October 2014)

Application for Feed-in-Account Holder (FiAH)

RELATED LAWS AND REGULATIONS

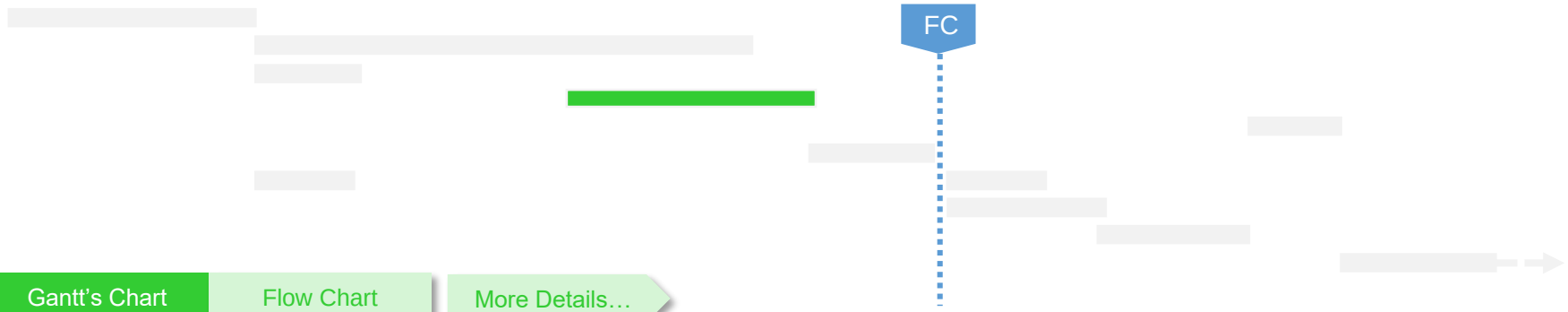
Regulation No.	Name
Act 725	Renewable Energy Act (Act 725)
Act 726	SEDA Act (Act 726)

Application for Feed-in-Account Holder (FiAH)

CHALLENGES AND RISKS

Challenges	Details	Recommendations
Application rejected	Application rejected due to non-conformity to document requirements	A thorough check must be conducted when filling out the application form
Large number of applications received	Large number of applications received by SEDA	Timely submission of application for the FiA along with proper documentation
Ultimate ownership	Ultimate ownership exceeded 30 MWp for all cumulative installations of Solar PV plants	The applicant must ensure that the total installed capacity does not exceed 30 MWp

Risk	Details
Rejection from SEDA	SEDA may reject applications for FiA due to failure to submit all requested documents, regardless of whether the developer has already invested a considerable amount of time and money in conducting a preliminary study, e.g., feasibility study (FS), site visit, PSS, etc.

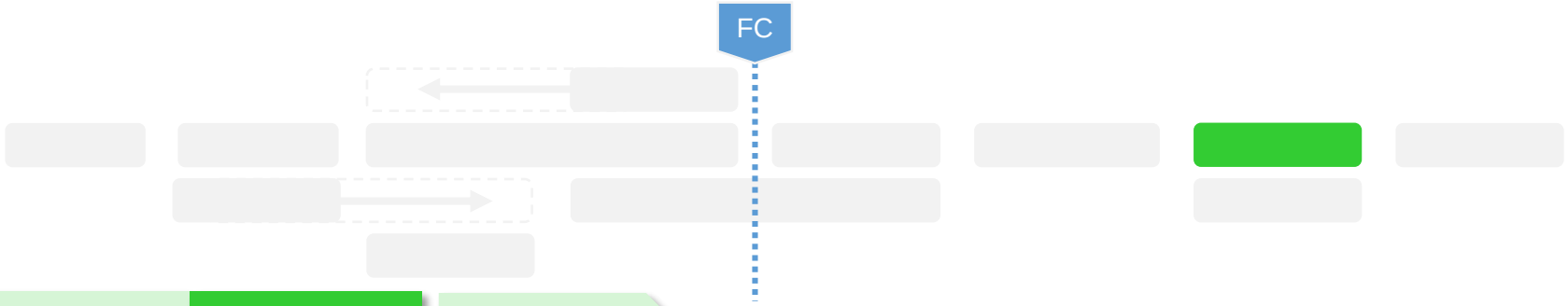


Gantt's Chart | Flow Chart | More Details…

Step 3 | Power Purchase Agreement

3-1 Registration of DL vendor

3-2 Power Purchase Agreement (PPA)



Step 3 | Power Purchase Agreement

3-1

Registration of DL vendor

3-2

Renewable Energy Power Purchase Agreement (REPPA)

Registration of Distribution Licensee Vendor

DESCRIPTION

This step describes the process for registering a company as a Distribution Licensee vendor with TNB. The DL vendor is an integral part of power generation and distribution.

Registration of Distribution Licensee Vendor

DESCRIPTION

This step describes process for registering a company as a Distribution Licensee vendor with TNB. The DL vendor is an integral part of power generation and distribution. This is to ensure that TNB can process and provide payment to the installation owner for the energy generated by the small Solar PV plant. Observe the following procedure on how to register as a Distribution Licensee (DL) vendor with TNB:

1. Submission of documents to TNB RE unit
2. TNB reviews completeness of documents
3. Developer is approved as TNB DL vendor
4. DL vendor number issued by TNB

RELATED AUTHORITIES

Federal level	▪ TNB
State level	▪ (none)
Local level	

Registration of Distribution Licensee Vendor

REQUIRED DOCUMENTS

The following technical documents must be prepared and submitted during the registration process for DL vendor:

- Copy of FiAH certificate (Sub Step 2-1)
- Copy of developer Form 24 and 44
- Copy of developer Form 49
- Copy of Form Q
- Copy of electricity bill
- Copy of approval letter and CCC report (Sub Step 1-3)

Registration of Distribution Licensee Vendor

$RM FEES / COST

- There is no fee for this sub-step

DURATION

- This sub-step usually takes around **2 weeks**

Registration of Distribution Licensee Vendor

CHALLENGES AND RISKS

Challenges	Details	Recommendation
Non-registration as DL vendor	Due to non-compliance with requirements, your application may be rejected	It is recommended to prepare all documents in advance to avoid rejection and reapplication for registration as DL vendor

Step 3 | Power Purchase Agreement

… Gantt's / Flow Chart

Step Description

This section explains how to obtain a Renewable Energy Power Purchase Agreement (REPPA) duly signed by SEDA.

Renewable Energy Power Purchase Agreement (REPPA)

DESCRIPTION

This sub-step explains how to obtain a signed Renewable Energy Power Purchase Agreement (REPPA) between SEDA and Distribution License (DL).

The following procedure is adopted while applying for REPPA:

1. RE developer submits documents to TNB RE unit
2. TNB RE unit reviews the documents and checks for completeness
3. If the documents are complete, TNB RE issues a payment order to the applicant and fee for energy meter
4. RE project developer submits proof of payment
5. Renewable Energy Power Purchase Agreement is ready to be signed

RELATED AUTHORITIES

Central government	▪ SEDA
Provincial government	▪ (none)
Local government	▪ (none)

Renewable Energy Power Purchase Agreement (REPPA)

REQUIRED DOCUMENTS

- The following documents (three sets) are to be submitted for REPPA

Filled-out REPPA form along with copies of the following documents:

a. Feed-in Application Holder (FiAH) certification
b. Appendices according to the REPPA standard list

Renewable Energy Power Purchase Agreement (REPPA)

$ RM FEES / COST

- There is no fee for this sub-step

DURATION

- This sub-step usually takes around **2 to 3 months**

Renewable Energy Power Purchase Agreement (REPPA)

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Act 725 (2011)	Renewable Energy Act (Act 725)
Act 726 (2011)	Sustainable Energy Development Authority (SEDA) Act (726)

Renewable Energy Power Purchase Agreement (REPPA)

REFERENCE DOCUMENTS / SOURCES

Guidelines and Determination of the Sustainable Energy Development Authority Malaysia

This guideline is known as “SEDA Guidelines”. It can be downloaded from the SEDA website (www.seda.gov.my)

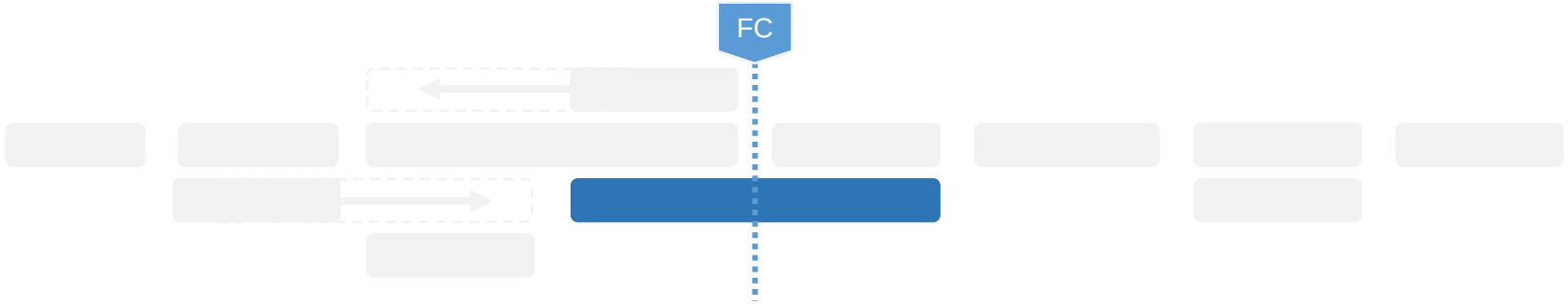
Official REPPA form

The official REPPA form can be downloaded from the SEDA website (www.seda.gov.my)

Renewable Energy Power Purchase Agreement (REPPA)

CHALLENGES AND RISKS

Risk	Details
Delay in signing the REPPA	Possible delays may arise due to failure to satisfy the DL requirements, e.g., incomplete supporting documents, drawings and appendices. The developer must confirm the requirements with the DL officer before submitting REPPA.



Step 4 | Registration and License

4-1

Obtaining Public Generating license from Energy Commission

Obtaining Public Generating License from Energy Commission

DESCRIPTION

This section details how to obtain a Public Generating License from the Energy Commission, Malaysia.

The Electricity Supply Act 1990 (and subsequent amendment in 2001) stipulates the need for any activity related with the supply of electricity to be licensed. Provisional License is obtained prior to construction of RE plant. Therefore, a public generating license must be obtained at least three months prior to the commissioning of a renewable energy plant.

The Public Generating License involves the following steps:

1. Register Developer details online at EC website
2. Upload documents at EC website and submit hard copy to EC office
3. EC reviews completeness of documents submitted
4. If complete, EC issues order for payment and License Fees to developer
5. Developer to submit proof of payment
6. Permit is issued post COD

RELATED AUTHORITIES

Federal level	Energy Commission Malaysia (EC)
State level	▪ (none)
Local level	

Obtaining Public Generating License from Energy Commission

REQUIRED DOCUMENTS

Prior to obtaining a Public Generating License, the following documents must be submitted:

- Duly filled out application form
- Supporting documents
  a. Certified copy of FiAH Certificate issued by SEDA
  b. Site location map
  c. Single Line Diagram (SLD) of Grid Interconnection
  d. Summary of RE project

Obtaining Public Generating License from Energy Commission

$RM FEES / COST

- The fee charged for the issuance of a Public Generating License is as follows:

Processing Fee	RM 100
Per kW capacity of RE plant up to 5 MW	RM 0.011 per kW
Above 5 MW	RM 1.65 per kW

The minimum fee for a permanent license is RM 100 and the maximum fee is RM 2,200

DURATION

- Issuance of Public Generating License takes 4 weeks

Obtaining Public Generating License from Energy Commission

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Act 725	RE Act 2011 (Act 725)
Act 1990	Energy Supply Act 1990 (Amendment 2001)

Obtaining Public Generating License from Energy Commission

REFERENCE DOCUMENTS / SOURCES

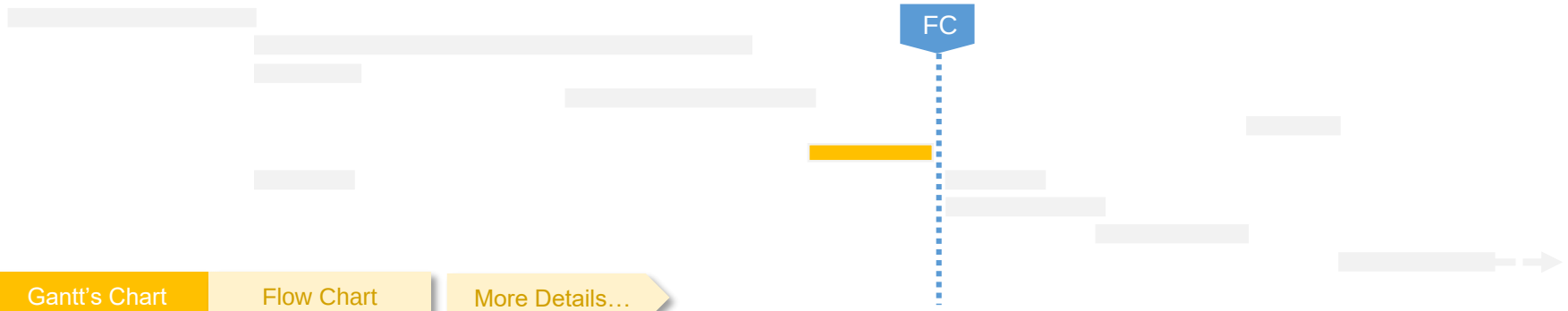
Document name	Description
Peninsular Malaysia Grid Code	This document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html
Labuan and Sabah Grid Code	This document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html
Distribution Code	This document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html
TNB Interconnection Guidebook	"Technical Guidebook for the Connection of Generation to the Distribution Network" was published by TNB Research Sdn. Bhd. It is to be used by distributed generation (DG) developers, plant managers or engineers, technical consultants and engineers of power utility. This document can be downloaded from http://www.st.gov.my/index.php/download-page/category/94-guidelines-electricity.html. The latest guidebook is the first edition (published March 2005)

Obtaining Public Generating License from Energy Commission

CHALLENGES AND RISKS

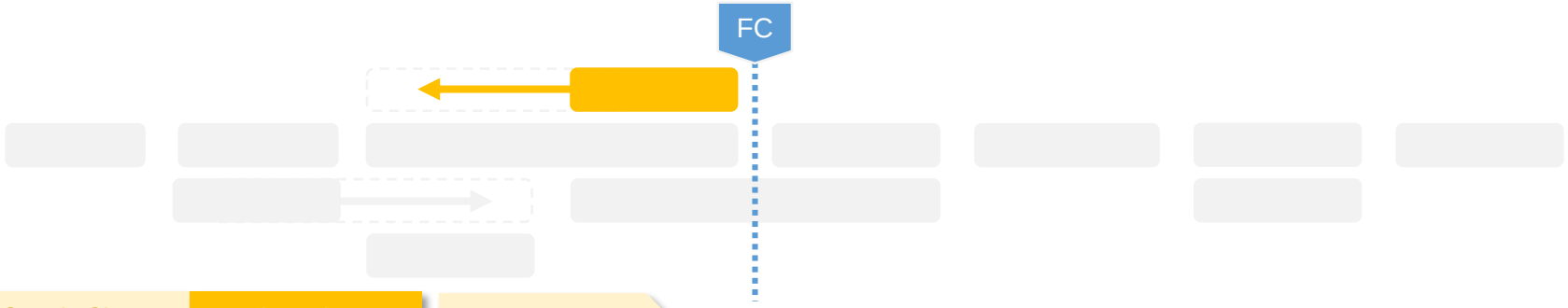
Challenges	Details	Recommendation
Delays due to failure to satisfy EC documentary requirements	The allocation of a Public Generating License from the Energy Commission may be delayed if the submission lacks the required documents	It is recommended to co-ordinate with the Energy Commission to determine the supporting documents needed

Risk	Details
Cost escalation due to delays	Overall project costs may increase due to delays or the project may no longer be available



Step 5 | Financing

5-1	Financing Facility - Term Loan



Step 5 | Financing

5-1

Financing Facility - Term Loan

Financial Closure

10-1

Green Tech Financial Scheme (GTFS)

10-2

Pioneer Status

Step 5 | Financing

… Gantt's / Flow Chart

Step Description

The following step details the documentation required prior to submission to a banking institution in order to obtain financing. Documents required vary from bank to bank. The procedure for submitting documents and the approval process may also vary from one bank to another. To comply with a specific bank's requirement(s), a list of documents and forms can be obtained from the loan department of the bank or may be downloaded from the website, if available online.

Financing Facility - Term Loan

DESCRIPTION

The following step details the documentation required prior to submission to a banking institution in order to obtain financing. The documents required vary from bank to bank. The procedure for submitting documents and the approval process may also vary from one bank to another. To comply with a specific bank's requirement(s), a list of documents and forms can be obtained from the loan department of the bank or may be downloaded from the website, if available online.

Applied Procedure:

To comply with a financial institution's requirements, a list of documents and forms needed can be obtained from the loan department of the bank or may be downloaded from their website, if available online.

RELATED AUTHORITIES

Federal level	▪ (none)
State level	▪ (none)
Local level	▪ (none)

Financing Facility - Term Loan

REQUIRED DOCUMENTS

- Background of the company (brief history), commencement of business, principal activities, number of employees, business plan, etc.
- Shareholding structure
- Profile of Shareholders
- Profile of Board of Directors
- Profile of Key Management Personnel
- Memorandum & Articles of Association (M&A) of the company
- Latest Forms 24, 49, 9, 13 and 44 under the Companies Act 1965, latest annual returns and photocopy of NRIC of Directors
- Detailed list of completed projects (where applicable)
- Detailed list of on-going projects (where applicable)
- New incorporated – support by the ultimate holding company
- Full valuation report on project land/asset/machinery/ equipment
- Details and status of the land and copy of land title (where applicable)
- Declaration form (DFIA 2002, Section 28) to be signed by individual directors/individual shareholders/guarantors in the presence of Commissioner of Oath
- Personal Net Worth Statement to be submitted by individual guarantor
- Statutory documents and information of corporate guarantors (where applicable)
- Economic planning unit / ministry of finance or other relevant approval / support letters

Financing Facility - Term Loan

REQUIRED DOCUMENTS

- Environment Impact Assessment Report/DOE approval if it falls under the category that requires EIA
- Relevant licenses
- Project description
- Project implementation schedule/timeline
- Study on market, technical and financial aspects
- Project feasibility study
- Background of contractors/suppliers
- Contract structure
- Project Implementation Schedule and timeline
- Background of Contractors / Consultants / Suppliers
- Comments on Performance up-to-date
- Projected Financial Performance: Profit & Loss / Cash Flow / Balance Sheet / Underlying Assumptions / Sensitivity Analysis
- Risk Analysis and Mitigation Measures
- Shareholders / Joint Venture Agreements
- Project Management Agreements
- Operations and Maintenance Agreements
- Approved GTFS certificate (Step 10-1)

Financing Facility - Term Loan

REQUIRED DOCUMENTS

A | Fee

- The average processing fee varies from one bank to another and may be confirmed with the respective institution prior to and during the application process

B | Duration

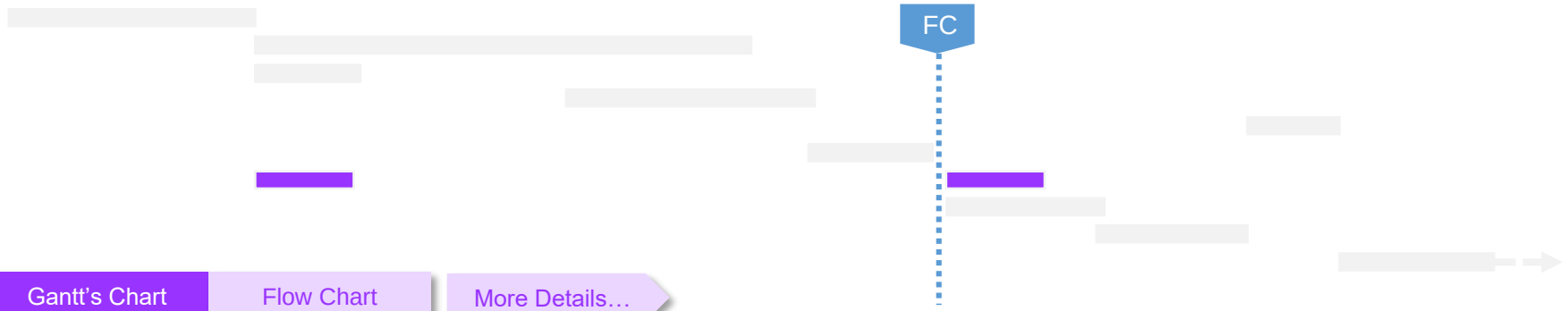
- 3 - 12 months

Note: Indicated fee in USD is only approximate based on the currency conversion of USD 1 = PHP 3.27 (as of October 2014)

Financing Facility - Term Loan

REQUIRED DOCUMENTS

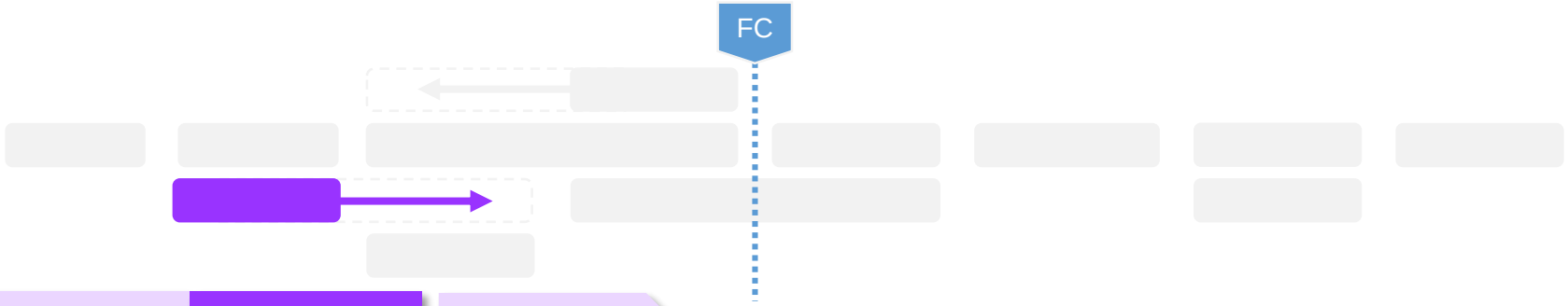
Challenges	Details
Banks are quite new to renewable energy projects. This may result in a longer processing period and high collateral requirement, or higher interest rate	It is imperative to engage with the bank official early on to explain the technology. Joint site visits may also help. Having the GTFS certificate would assist in application.
Risk analyses are not truly assessed due to limited technical accessibility and know-how	A centralised unit dealing with the assessment of RE-based projects will enable financial institutions to sanction loans faster



Gantt's Chart | Flow Chart | More Details…

Step 6 | Corporate Fiscal / Legal

6-1 Registration with the Companies Commission of Malaysia (SSM)



Step 6 | Corporate Fiscal / Legal

6-1

Registration with the Companies Commission of Malaysia (SSM)

Step 6 | Corporate Fiscal / Legal

… Gantt's / Flow Chart

Step Description

This section describes the steps to setting up a Special Purpose Vehicle/Entity (SPV) for the development of small solar PV schemes. The process involves incorporation and registration with the Companies Commission of Malaysia (Suruhanjaya Syarikat Malaysia, SSM in Malay). It should be noted that some states require state-nominated companies to be part of the shareholders. For RE projects to be eligible for the FiT programme by SEDA, the developer must be at least 51% Malaysian-owned. Ultimate individual shareholding in all cumulative solar installation must not exceed 30 MW.

Registration with the Companies Commission of Malaysia (CCM)

DESCRIPTION

This section describes the steps to setting up a Special Purpose Vehicle/Entity (SPV) for the development of small SPV schemes. The process involves incorporation and registration with the Companies Commission of Malaysia (CCM) (Suruhanjaya Syarikat Malaysia, SSM in Malay). It should be noted that some states require state-nominated companies to be part of the shareholders. For RE projects to be eligible for the FiT programme of SEDA, the developer must be at least 51% Malaysian-owned.

The procedure for registering with Companies Commission of Malaysia is given below.

Applications for incorporation or registration are done by a licensed company secretary with the CCM/SSM offices, and the following activities must be conducted before approaching CCM/SSM:

- Name search to ensure the proposed name of the company is available
- Incorporation documents are then lodged with CCM/SSM

RELATED AUTHORITIES

Related Authority

Central government	▪ Federal SSM
Provincial government	▪ State branch offices
Local government	

Registration with the Companies Commission of Malaysia (CCM)

REQUIRED DOCUMENTS

- Form 13A CA for Name search

- Incorporation Documents
  - Memorandum and Article of Association
  - Form 48A (Statutory Declaration by a director or promoter)
  - Form 6 (Declaration of Compliance)
  - Original copy of Form 13A
  - Copy of letter from CCM/SSM approving the company name
  - Copy of identity card/passport of each director and company secretary

Registration with the Companies Commission of Malaysia (CCM)

FEES / COST

▪ Fee for authorised share capital of RM 1,000 *(USD 230)* varies to capital of RM 400,000 and above *(USD 92,230)*	RM 1,000 *(USD 230)* RM 40,000 *(USD 92,230)*

DURATION

- If name is approved, incorporation can take place within 5 working days

Note: Indicated fee in USD is only approximate based on the currency conversion of USD 1 = PHP 3.27 (as of October 2014)

Registration with the Companies Commission of Malaysia (CCM)

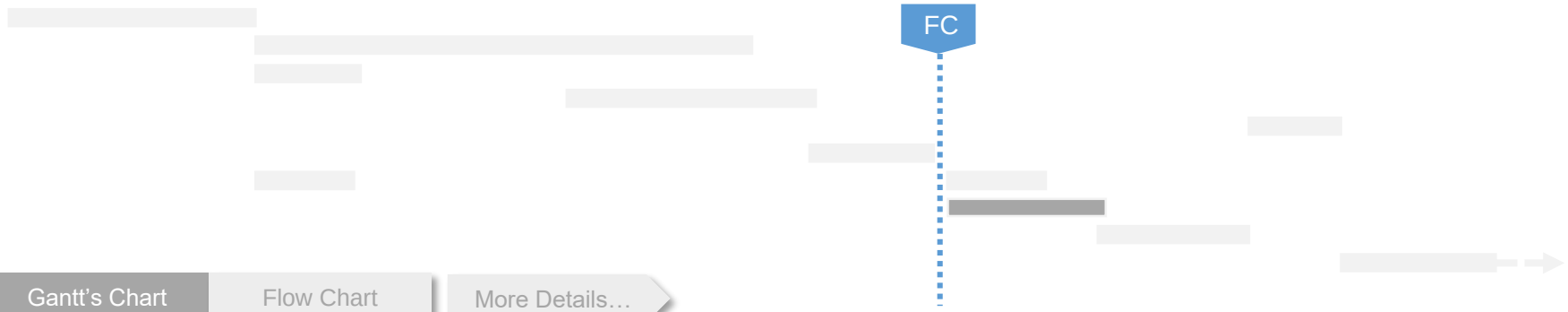
§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Act 65 (1965)	Companies Act 1965 (Act 65)
Act (2011)	Renewable Energy Act 2011

Registration with the Companies Commission of Malaysia (CCM)

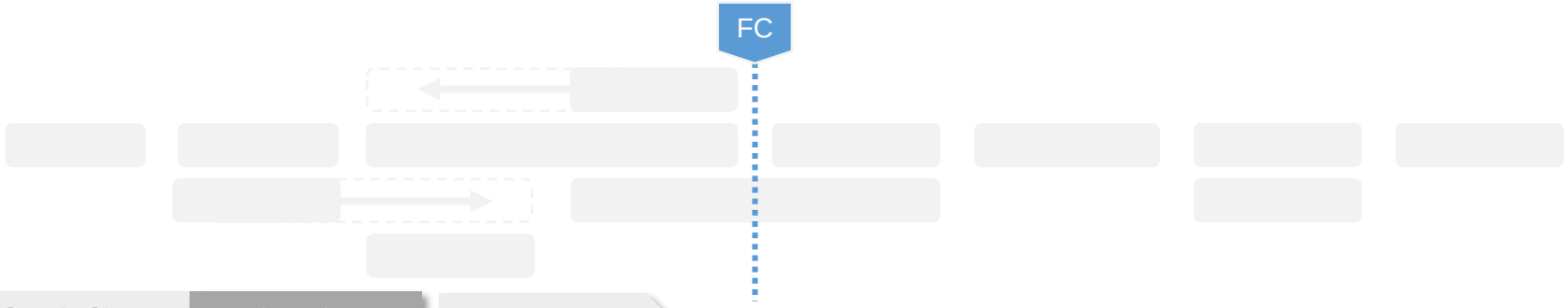
REFERENCE DOCUMENTS / SOURCES

Document Name	Description
Guidelines and form available on SSM website	www.ssm.com.my



Step 7 | Procurement and Construction

7-1	Procurement of Technical Consultant
Procurement of Solar Equipment and Ancillaries	7-2
Procurement of Civil and Structural Work	7-3



Step 7 | Procurement and Construction

7-1

Procurement of Technical Consultant

7-2

Procurement of Solar Equipment and Ancillaries

7-3

Procurement of Civil and Structural Work

Step 7 | Procurement and Construction

… Gantt's / Flow Chart

Step Description

The following step involves the procurement of technical consultancy services during the implementing stages of the scheme for small Solar PV design, preparing tender documents and work supervision. Service provider companies must be registered with SEDA. This step is sub-divided into three steps dealing with each activity in detail.

Procurement of Technical Consultant/Registered PV Service Provider

DESCRIPTION

- This involves the procurement of technical consultancy services during the implementing stages, i.e. civil structure, transmission facility design, preparing tender documents and supervision at work. Service provider companies must be registered with SEDA.

Applied Procedures for the procurement of a technical consultant are given below:

Official appointment via Letter of Appointment (LoA) and consultancy contract (FIDIC – Blue Book) for technical consultant and normal letter of award with Term of References (ToR) for service provider.

RELATED AUTHORITIES

Related Authority

Central government	▪ Board of Engineers Malaysia (BEM) ▪ SEDA
Provincial government	
Local government	

Procurement of Technical Consultant/Registered PV Service Provider

REQUIRED DOCUMENTS

- The technical consultant will provide a proposal consisting of:
  - A technical proposal covering the scope and duties
  - Financial proposal indicating the professional fees and reimbursable charges

- Deliverables during the implementing stages are:
  - Design report
  - Tender Documents
  - Drawings
  - Project Reporting Deliverables
  - Liaising with local authorities and obtaining approval

Procurement of Technical Consultant/Registered PV Service Provider

$ RM FEES / COST

- Consultants usually charge 5 % - 6 % of capital expenditure

DURATION

- Procurement during the construction period

Procurement of Technical Consultant/Registered PV Service Provider

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Renewable Energy Act (2011)	

Procurement of Technical Consultant/Registered PV Service Provider

CHALLENGES AND RISKS

Challenges	Recommendation
Unscrupulous suppliers and contractors may try to undermine the authority of and working arrangement with the consultant	The developer shall be clear on the scope of the consultant and the relationship with the suppliers and contractors. This is to ensure the implementation of the scheme is done professionally.
Engaging inexperienced consultants may lead to poor implementation of the scheme	Hiring a consultant who is inexperienced in procurement may lead to project delays, improper procurement or may even result in project failures.

Procurement of Solar Equipment and Ancillaries

DESCRIPTION

This step describes the procurement of solar equipment and ancillaries: solar panels, inverters, cabling, equipment in powerhouse/control house area (switchgears, transformers and others) including installation, testing and commissioning.

RELATED AUTHORITIES

Related Authority

Central government	▪ SEDA ▪ TNB ▪ EC
Provincial government	▪ TNB State ▪ Factory and Machinery Department
Local government	▪ TNB District

Procurement of Solar Equipment and Ancillaries

DESCRIPTION

Applied Procedures:

i. The technical consultant prepares the documents for the bidding as outlined in Sub-Step 7-1
ii. Potential suppliers and contractors are invited to bid and submit technical and financial proposals
iii. Evaluation of the submitted bids/proposals is done jointly with the developer and consultants
iv. Approval of successful bidders/suppliers is confirmed by the developer board
v. Appointment via Letter of Award and contract (FIDIC - Yellow Book)
vi. Design stage
vii. Fabrication stage
viii. Delivery stage
ix. Installation stage

RELATED AUTHORITIES

FIDIC: International Federation of Consulting Engineers

Procurement of Solar Equipment and Ancillaries

REQUIRED DOCUMENTS

- Financial proposal
- Technical proposal
- Technical drawings and design
- Test procedures
- Test reports
- Operation and Maintenance (O&M) manuals

Procurement of Solar Equipment and Ancillaries

$ RM FEES / COST

- The project cost varies depending on type and parameters of Solar PV cells/modules, type of PV, inverter, Balance of Plant, etc.

DURATION

- 3 - 4 months for the tendering stage
- 12 - 16 months for the post-award period

Procurement of Solar Equipment and Ancillaries

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Electrical Supply Act (1990)	Electricity Supply Act 1990

Procurement of Solar Equipment and Ancillaries

REQUIRED DOCUMENTS

Document Name	Description
TNB Technical Guidebook	TNB Technical Guidebook for Generation in Distribution Network 2005
TNB Distribution Grid Code	
Relevant IEC, IEEE, BS EN standards	

Procurement of Solar Equipment and Ancillaries

REQUIRED DOCUMENTS

Challenges	Details
Components of the equipment are substandard resulting in frequent failure and downtime	Ensure that all components are properly designed, manufactured and adequately tested to meet quality standards. Thorough, frequent checks are encouraged, and if required in-house tests/checks may be considered in co-ordination with the hired consultant.
Installation of inferior equipment due to excessive cost cutting can lead to frequent failures, downtime and even rejection from TNB and SEDA	Focus on long-term gains and quality. Sub-standard components may lead to poor performance and equipment failure. This will ultimately lead to higher project costs.

Procurement of Civil and Structural Work

DESCRIPTION

- This step involves the procurement of civil and structural work such as preliminaries, earthwork, roads, drainage, solar panel support, inverter, control switchgear, control room/building installation and other construction as required.
- Applied Procedures:
  The technical consultant prepares documents for the bidding as mentioned in Sub-step 7-1
  Potential suppliers and contractors are invited to bid and submit technical and financial proposals
  Evaluations of the submitted bids/proposals are done jointly with the developer and consultants
  Approval of successful bidders/suppliers are confirmed by the developer board
  Appointment via Letter of Award and contract (FIDIC – Red Book)
  Fabrication stage
  Delivery stage
  Construction stage

RELATED AUTHORITIES

Related Authority

Central government	▪ -
Provincial government	▪ -
Local government	▪ Jabatan Kerja Raya (Public Works Department) ▪ Jsbatan Perancangan Bandar dan Desa (Town Planning Department) ▪ District Office

FIDIC: International Federation of Consulting Engineers

Procurement of Civil and Structural Work

REQUIRED DOCUMENTS

- Completed Bill of Quantity (BOQ) and financial proposal
- Method or statements for work procedures
- Test procedures
- Test reports and certificates
- As-built documents and drawings
- Operation and Maintenance manuals

Procurement of Civil and Structural Work

$RM FEES / COST

- Project cost varies depending on location and size

DURATION

- 2 months for bidding/tender process
- The construction period is approximately 12 months and depends on the project developer

Procurement of Civil and Structural Work

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Contract Act (1950)	Malaysian Contract Act 1950
CIBD Act (1994)	Construction Industry Development Board Act 1994
Factories and Machinery Act (1967)	Factories and Machinery Act 1967
OSHA (1994)	Occupational Safety and Health Act 1994

Procurement of Civil and Structural Work

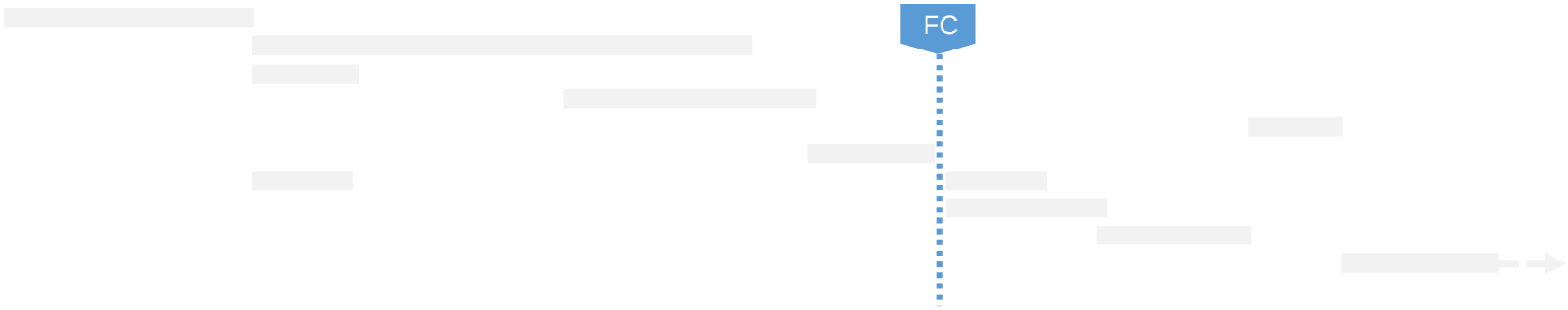
REFERENCE DOCUMENTS / SOURCES

Document Name	Description
Relevant standards	BS EN Standards
Relevant guidelines and manuals	American Society of Civil Engineer (ASCE) guidelines

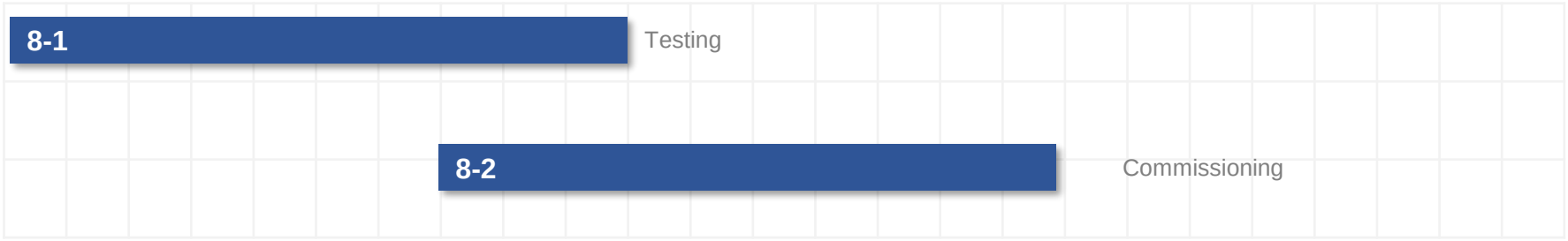
Procurement of Civil and Structural Work

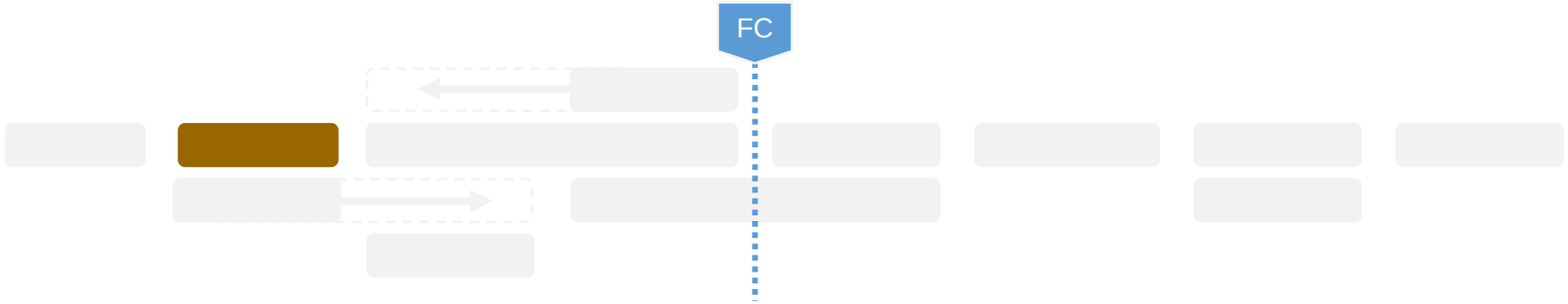
CHALLENGES AND RISKS

Challenges	Details
Bidding/tender stage taking too long and may affect civil work/construction	Advised to start the process early and complete them in a timely manner
Engaging inexperienced contractor may lead to delays and poor results	Hiring a competent consultant will help ensure the project runs smoothly



Step 8 | Testing and Commissioning





Step 8 | Testing and Commissioning

8-1

Testing

8-2

Commissioning

Step 8 | Testing and Commissioning

Step Description

This step outlines the testing of Small Solar PV plants and explains how to meet the requirements and obtain approval for the Initial Operating Date (IOD) and Commercial Operation Date (COD). During this step testing for electromechanical and transmission facilities shall take place. A full-load test can be carried out upon connecting to the grid; this can only be conducted once the IOD has been approved.

Testing

DESCRIPTION

This step explains the testing of small solar PV schemes and the requirements for obtaining approval for the Initial Operating Date (IOD) and the Commercial Operation Date (COD). Once the IOD is approved, full load tests may commence upon connecting to the grid.

Applied procedure:

Generally, test procedures are included in the technical proposal as mentioned in sub-steps 7-2 and 7-3. This applies to civil and structural work, electromechanical and transmission facilities respectively.

RELATED AUTHORITIES

Central government	▪ TNB ▪ EC ▪ SEDA
Provincial government	▪ TNB State
Local government	▪ TNB District

Note 1:

Testing

REQUIRED DOCUMENTS

The following documents are required for this sub-step:

- SEDA testing procedure
- Test certificates
- Test results

Note: All documents to be certified according to the Guidelines and Determinations of the Sustainable Energy Development Authority Malaysia

Testing

$ RM FEES / COST

- Deemed inclusive of the contract cost/price

DURATION

- The duration before the COD until obtaining approval is usually **3 months**

Testing

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Act 725 (2011)	Renewable Energy Act 2011 (Act 725)
Act 726 (2011)	Sustainable Energy Development Agency Act (Act 726)
Electricity Supply Act 1990	

Testing

REFERENCE DOCUMENTS / SOURCES

- TNB Technical Guidebook for Generation in Distribution Network 2005
- TNB Distribution Code
- Relevant IEC, IEEE, BS EN Standards
- SEDA testing procedure

Testing

CHALLENGES AND RISKS

Challenges	Recommendation
Failure to adhere to SEDA and TNB procedures	Due diligence of plant must take place before testing commences
Parameters do no match with PSS outcome, resulting in poor equipment performance	Proper care must be taken before the components are purchased and installed. To help ease the process, the parameters set by the TNB and PSS reports should be adhered to so as to avoid any unnecessary challenges.

Commissioning

DESCRIPTION

The commission process occurs after successful testing at the facility. It includes approval from SEDA for the Commercial Operating Date (COD) commencement.

Applied procedure:

RELATED AUTHORITIES

Central government	▪ TNB ▪ EC ▪ SEDA
Provincial government	▪ TNB State
Local government	▪ TNB District

Note 1:

Commissioning

REQUIRED DOCUMENTS

The following documents are required for submission:

- Test certificates
- Test results

Note: All documents to be certified according to the Guidelines and Determinations of the Sustainable Energy Development Authority Malaysia

Commissioning

$RM FEES / COST

- Deemed inclusive of the contract costs/price

DURATION

- Please allow for **1 month** prior to obtaining the COD

Commissioning

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Act 725 (2011)	Renewable Energy Act 2011 (Act 725)
Act 726 (2011)	Sustainable Energy Development Agency Act (Act 726)
Electricity Supply Act 1990	

Commissioning

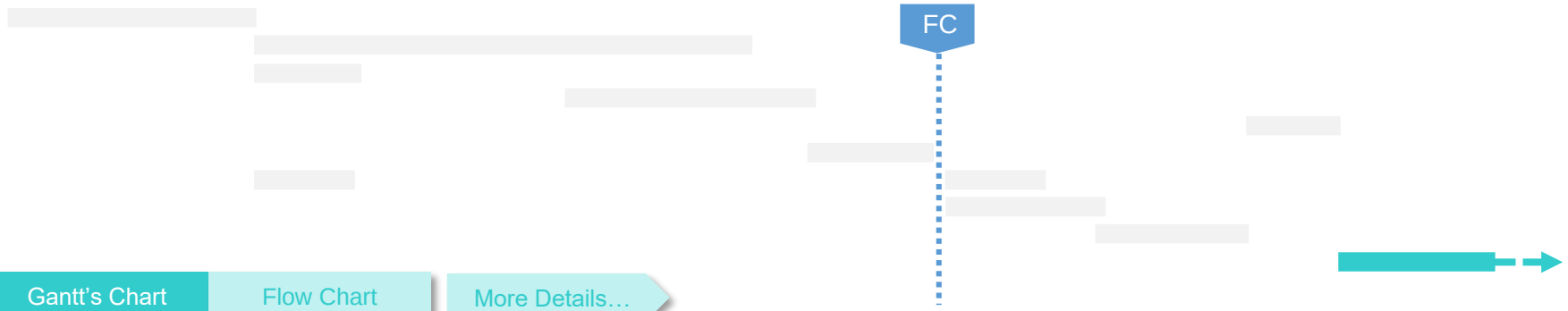
REFERENCE DOCUMENTS / SOURCES

- TNB Technical Guidebook for Generation in Distribution Network 2005
- TNB Distribution Code
- Relevant IEC, IEEE, BS EN Standards

Commissioning

CHALLENGES AND RISKS

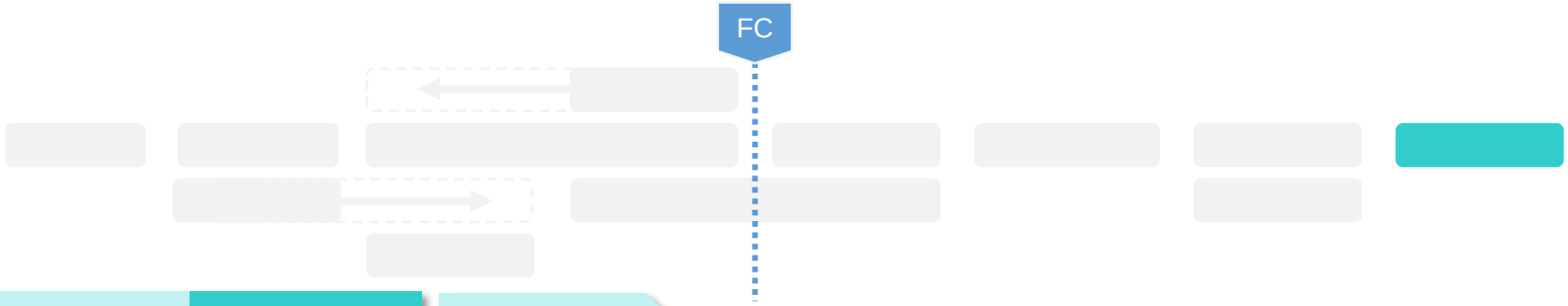
Challenges	Recommendation
Failure to adhere to SEDA and TNB procedures	Due diligence of plant must take place before testing commences
Parameters do no match	Proper care must be taken before the components are purchased and installed



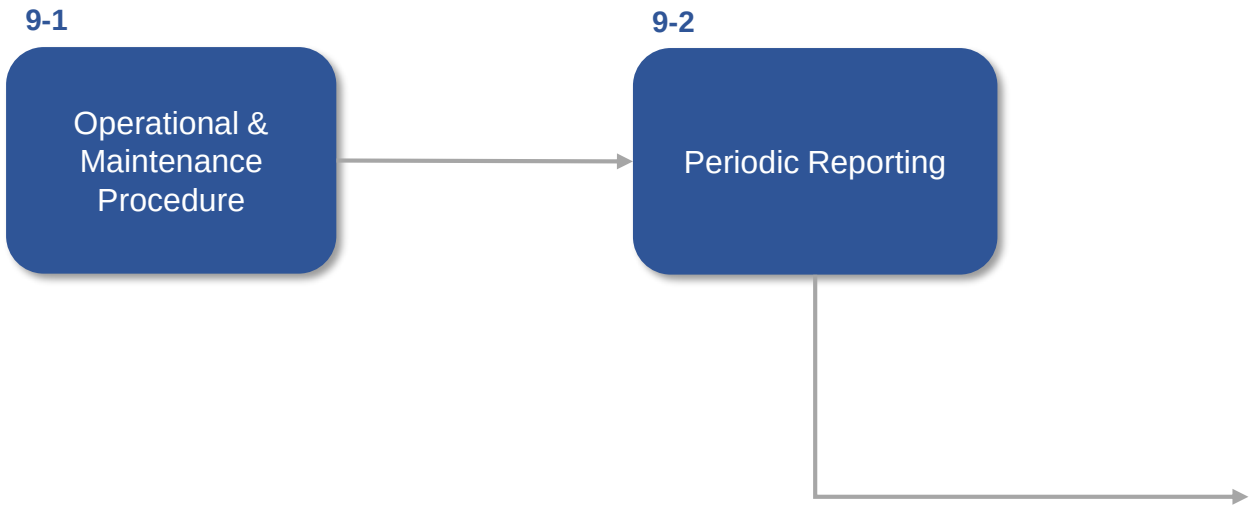
Gantt's Chart | Flow Chart | More Details…

Step 9 | Operation and Maintenance

9-1	Operational & Maintenance Procedure
9-2	Periodic Reporting



Step 9 | Operation and Maintenance



Step 9 | Operation and Maintenance

… Gantt's / Flow Chart

Step Description

This step details the requirements for the operation and maintenance (O&M) of a solar PV power plant to ensure operations run smoothly. The operational reliability of a power plant's solar generating units shall be such that they are able to generate the highest level of output based on the availability of the sun.

DESCRIPTION

The purpose of this sub-step is to define the technical requirements and procedures for the operation and maintenance (O&M) of small Solar PV plants. This is to ensure the plant remains optimal and can last for the project's lifetime. Good O&M procedures increase the operational reliability so that the PV plant can in turn generate higher output while maintaining optimal efficiency under the given conditions.

In principle, the power plant must be operated according to the standards and requirements set forth by the Energy Commission (EC), e.g. grid code, distribution code, etc. Thus, the operation and maintenance (O&M) manual must reflect those requirements. Typically, the procedure for developing an O&M manual involves the following:

1. Equipment manufacturers to submit O&M manual, drawings and O&M plans or schedule to developer
2. Developer to have a dedicated team operate the station according to the O&M manual
3. Alternatively, the developer may engage a qualified third party to carry out O&M tasks

RELATED AUTHORITIES

Central government	▪ EC
Provincial government	▪ EC State office
Local government	▪ -

Operational & Maintenance Procedure

$RM FEES / COST

- Typically, there is no additional fee for this sub-step as the preparation of the O&M manual should already be included with equipment suppliers

DURATION

- Prior to commissioning

Operational & Maintenance Procedure

§ RELATED LAWS AND REGULATIONS

Regulation No.	Name
Electrical Supply Act (1990)	Electrical Supply Act 1990

Operational & Maintenance Procedure

REFERENCE DOCUMENTS / SOURCES

Energy Commission Guidelines

The relevant guidelines can be downloaded from the official EC website at www.st.gov.my

TNB Distribution Code

The latest distribution code can be downloaded from the official EC website at www.st.gov.my

TNB Technical Guide Book of DL

i.e. operation code / standard

Relevant technical standards

i.e. IEC, IEEE and BS EN standards, etc.

Operational & Maintenance Procedure

CHALLENGES AND RISKS

Challenges	Recommendations
Untrained staff	Untrained staff may result in equipment failure or permanent damage, thus proper diligence must be maintained when selecting staff for O&M; involve staff during installation, testing and commissioning
Supplied spares are inadequate	Selection of spares must be in accordance with SOP, and sufficient spares must be stored in order to avoid a sudden halt in operations
Non-compliance with maintenance schedule	Improper operation of plant may result in loss of revenue. This can be avoided with proper training and by selecting qualified personnel.

Periodic Reporting

DESCRIPTION

Over the lifetime of a small Solar PV project, the developer is required to regularly report to the authorities. There are three authorities involved in this sub-step: TNB or Distribution Licensee (DL), the Sustainable Energy Development Authority (SEDA), and the Energy Commission (EC).

Periodic reporting is required for the purpose of payment by TNB and also the monitoring of the small Solar PV plant's performance by EC.

RELATED AUTHORITIES

Federal level	▪ TNB ▪ EC ▪ SEDA
State level	▪ TNB State
Local level	▪ TNB District

Periodic Reporting

REQUIRED DOCUMENTS

The following information is to be submitted:

- TNB: electronically via TNB regional system and also manual forms
- SEDA: electronically

Periodic Reporting

RELATED LAWS AND REGULATIONS

Regulation No.	Name
Act 725 (2011)	Renewable Energy Act
Act 726 (2011)	Sustainable Energy Development Authority (SEDA) Act
Act 447 (1990)	Electricity Supply Act

Periodic Reporting

REFERENCE DOCUMENTS / SOURCES

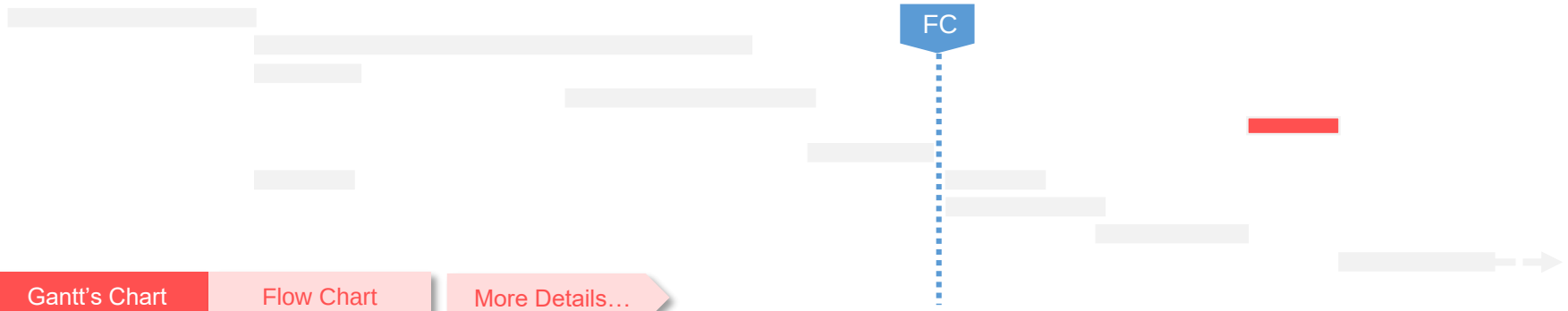
Standard reporting forms / templates

Forms and templates for periodic reporting are determined by the respective DL, SEDA and EC. Project developer must obtain the latest forms / templates directly from the respective authorities.

Periodic Reporting

CHALLENGES AND RISKS

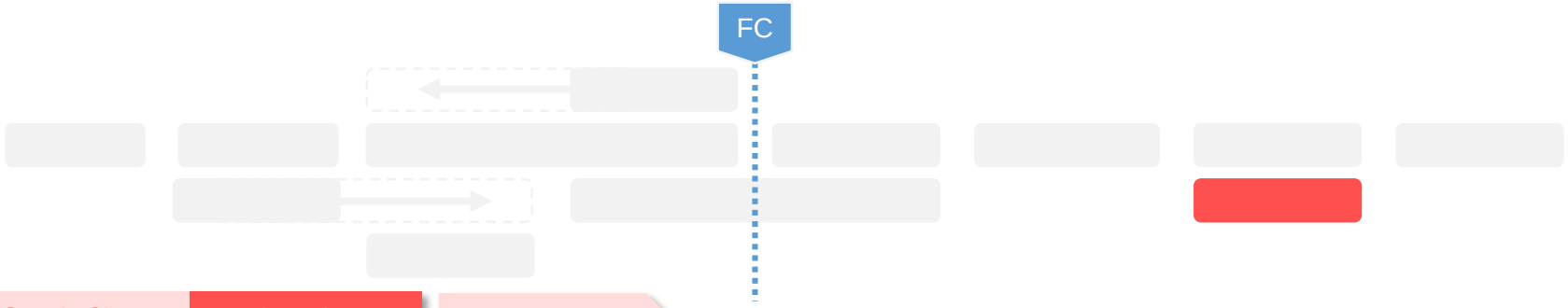
Risk	Details
Revocation of FiAH certificate	Noncompliance can lead to non-payment and rescinding of FiAH certificate and subsequent withdrawal from the FIT programme



Gantt's Chart | Flow Chart | More Details…

Step 10 | Supporting Mechanism

10-1	Green Tech Finance Scheme
10-1	Pioneer Status



Step 10 | Supporting Mechanism

10-1

Green Tech Finance Scheme

10-2

Pioneer Status

Step 10 | Supporting Mechanism

… Gantt's / Flow Chart

Step Description

This step details the various support schemes available for promoting Small Solar PV plants. These schemes are not available and may depend on the quota or with a timeline.

This step describes various sub-steps and procedures for various support mechanism existing in Malaysia. The step discusses on the following support schemes:

Green Technology Financing Scheme (GTFS)

Pioneer Status/Investment Tax Allowance

Green Tech Financing Scheme (GTFS)

DESCRIPTION

This section describes the steps in applying for the Green Technology Financing Scheme (GTFS). Acquisition of GTFS allows for a susbsidy of 2% against the loan/fund taken from the approved 24 financial institutions; banks will require proof of GTFS certification before issuance. The amount for the subsidy is limited to RM50m (USD 11.53 mil).

The procedures for GTFS are as follows:

1. All applications shall be submitted to GreenTech Malaysia
2. GreenTech Malaysia will screen and review completeness of all applications
3. Should the GTFS team require clarification on any issue or matter during the evaluation period, applicants shall furnish the requested information within 3 days from the date of notification
4. Applicants will be invited for a Business Review Presentation to present the viability of their business models, product market, projected financial performance, company management and the company's exit strategy.

RELATED AUTHORITIES

Related Authority

Central government	▪ GreenTech Malaysia – Evaluate the application, approve the financing scheme
Provincial government	
Local government	

Note: As of November 2014, the approved financing amounts to RM 2,000 million (~ USD 549 million), while a share of RM 1,500 million (~ USD 412 million) is still available.
Check the latest available quota at www.gtfs.my

Green Tech Financing Scheme (GTFS)

DESCRIPTION

5. The project will be tabled at the GTFS Committee (GC) meeting for final approval
6. GreenTech Malaysia will issue a notification letter to successful and unsuccessful applicants
7. A successful applicant will be issued a Green Project Certificate
8. Developer is required to perform presentations to the vetting commitee on the project's technical and financial viability

RELATED AUTHORITIES

Green Tech Financing Scheme (GTFS)

REQUIRED DOCUMENTS

- Certified copy of Form 9, 24 and 49
- Memorandum of Article (MOA)
- Approved layout drawing indicating the project boundary
- Organisational structure of the project management team
- RE Installation Design (Sub-step 1-2)

Green Tech Financing Scheme (GTFS)

$RM FEES / COST

- There is no application fee

DURATION

- Typically, the processing time is around **2 – 3 months**

Note: Indicated fee in USD is only approximate based on the currency conversion of USD 1 = PHP 3.27 (as of October 2014)

Green Tech Financing Scheme (GTFS)

§ RELATED LAWS AND REGULATIONS

Malaysia National Green Technology Policy 2009

Standard form and online procedures from Malaysia Green Technology Corporation (GreenTech Malaysia)

These documents can be downloaded from the official website of GreenTech at www.greentechmalaysia.my

Official website of GTFS

www.gtfs.my

Green Tech Financing Scheme (GTFS)

REFERENCE DOCUMENTS / SOURCES

Risk	Details
Delay of GTFS approval	If the submitted documents are incomplete, lack sufficient details or fail to meet the requirements, this may cause delays in GTFS approval. The developer must ensure the supporting documents are complete before submission.

Pioneer Status/Investment Tax Allowance

DESCRIPTION

A company that is granted Pioneer Status (PS) will enjoy tax exemption benefits for the RE technology being developed, e.g., a small Solar PV plant. Submissions requesting tax exemption must be done on or before 31 December of each year. The incentive has been extended until the year 2020.

Applied procedure:

Obtain an application form from the website www.mida.gov.my
Submit three copies of the completed application form to MIDA office

RELATED AUTHORITIES

Related Authority

Central government	▪ Ministry of Finance, Malaysia
Provincial government	
Local government	

Pioneer Status/Investment Tax Allowance

REQUIRED DOCUMENTS

- Form 24: Latest Return of Allotment of Shares certified by a Company Secretary
- Form 49: Latest Return giving particulars in Register of Directors, Managers and Secretaries and Change of Particulars certified by a Company Secretary
- Latest Annual Return certified by a Company Secretary
- Copy of approval by the Authority (EPU and SEDA)
- Copy of REPPA
- Project Proposal or Feasibility Study

Pioneer Status/Investment Tax Allowance

$ RM FEES / COST

- There is no application fee

DURATION

- Typically, the processing time is around **2 - 3 months**

Note: Indicated fee in USD is only approximate based on the currency conversion of USD 1 = PHP 3.27 (as of October 2014)

Pioneer Status/Investment Tax Allowance

§ RELATED LAWS AND REGULATIONS

Malaysia Industry Development Authority (MIDA) Act 1967
Income Tax Act 1967

Pioneer Status/Investment Tax Allowance

REFERENCE DOCUMENTS / SOURCES

Malaysia Annual Budget Guidelines/Rules (Ministry of Finance)

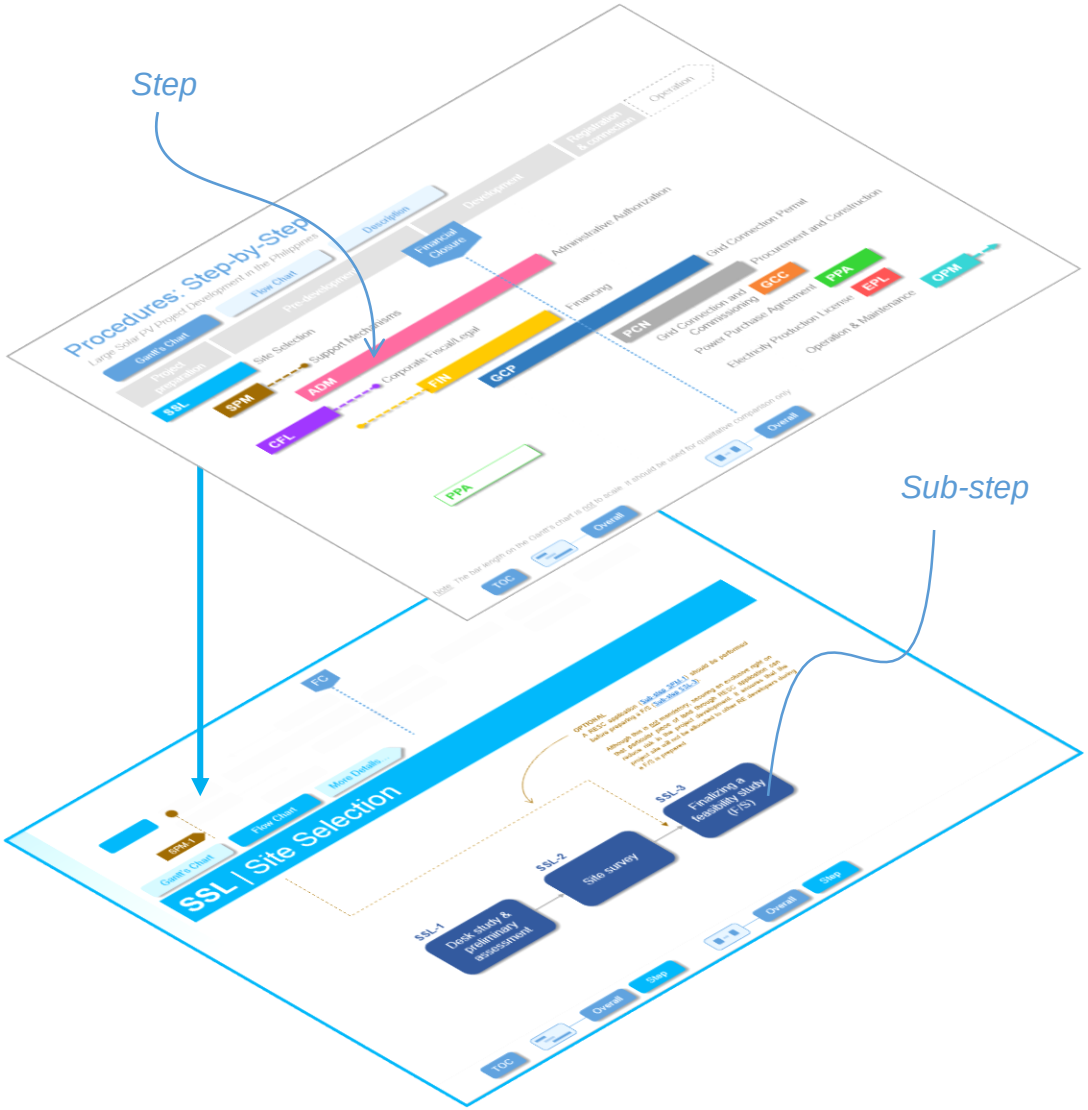
List of Abbreviations

Unless stated otherwise the following abbreviations shall be used throughout this guidebook:

ACE – ASEAN Centre for Energy
ASCE – American Society of Civil Engineers
AWWA – American Water Works Association
Board Engineers Malaysia
BS EN – British European Standards
CapEx – Capital Expenditure
CCM – Companies Commission of Malaysia (SSM in Malay)
COD – Commercial Operation Date
DID – Drainage and Irrigation Department
DL – Distribution Licensee
DSCR – Debt Service Coverage Ratio
DO – Development Order or District office
DOE – Department of Environment
EC – Energy Commission
EIA – Environment Impact Assessment
EPU – Economic Planning Unit
EXCO – State Executive Committee
FAT – Factory Acceptance Test
FS – Feasibility Study
FiAH – Feed-in Account Holder
FIDIC – International Federation of Consulting Engineers
FiT – Feed-in Tariff
GC – GTFS Committee
GTFS – Green Tech Finance Scheme
IEC – International Electrotechnical Commission
IEEE – Institute of Electrical and Electronics Engineers
IOD – Initial Operating Date
IRR – Internal Rate of Return
JKR – Jabatan Kerja Raya (Public Works Department)
JPBD – Jabatan Perancangan Bandar dan Desa (Town Planning Department)
kW – kilo Watt
kWp – kilo Watt peak
LAP – Land Acquisition Plan
M&A – Memorandum and Article of Association
MIDA – Malaysia Industry Development Authority
MOA – Memorandum of Article
MSMA – Storm Water Management Manual by DID
OSHA – Occupational Safety and Health
PBT – Phak Berkuasa Tempatan
PPA – Power Purchase Agreement
PPPU – Private Public Partnership Unit
PSS – Power System Study
PV – Photovoltaic
PWD – Public Works Department
RE – Renewable Energy
RE – Ringgit Malaysia
SEDA – Sustainable Energy Development Authority Malaysia
SLD – Single Line Diagram
SSM – Suruhanjaya Syarikat Malaysia (Malay for CCM)
TERAJU – Unit Peneraju Agenda Bumiputera
TNB – Tenaga Nasional Berhad
UKAS – Unit Kerjasama Awam Swasta
USD – United States Dollar

How to use the Guideline

Guideline Structure



"Two levels of details"

Overview Layer

From the overview layer, readers can view the entire procedure in project development (from site selection to operation and maintenance). It gives a big picture on how biomass/biogas project development in Indonesia has to be done. Only predefined steps are shown in this layer in different color codes (e.g., site selection, administrative authorisation, etc.). These steps are standardised for every guideline.

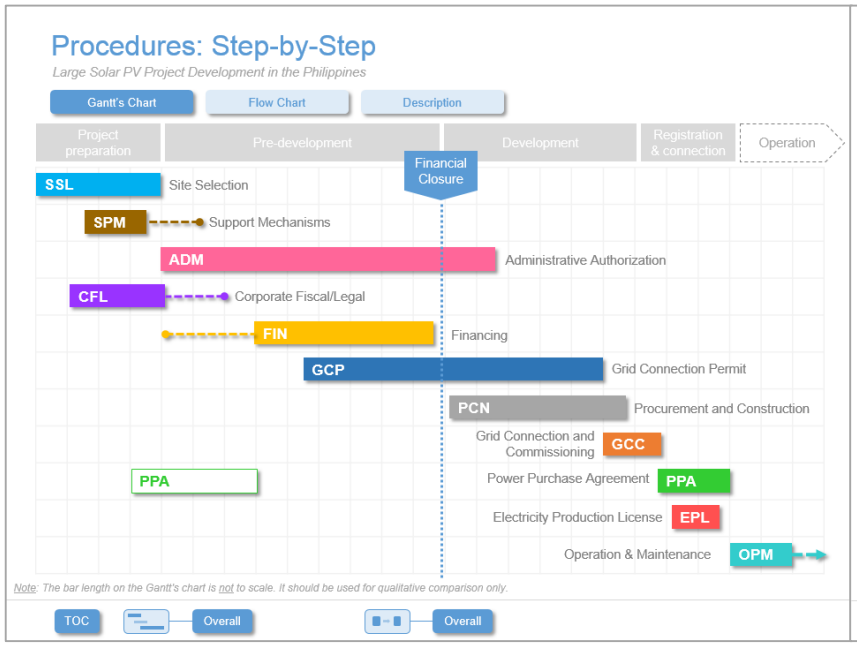
Detailed Layer

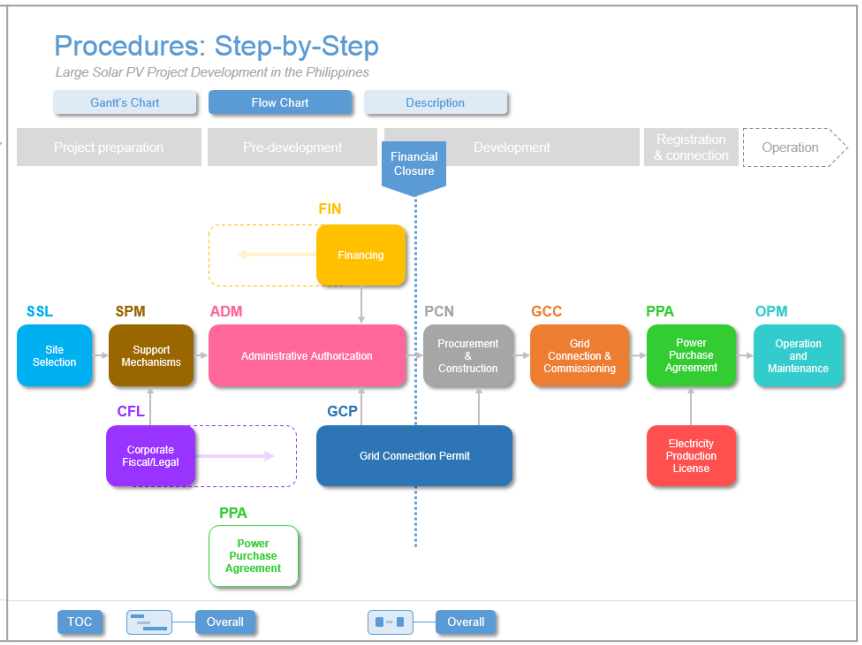
The detailed layer provides additional details for each of the steps shown in the overview layer. This allows for more flexibility in providing readers with details on specific project development phases.

How to use the Guideline

Guideline Structure

"Two ways to illustrate the procedural flow"





Gantt's Chart View

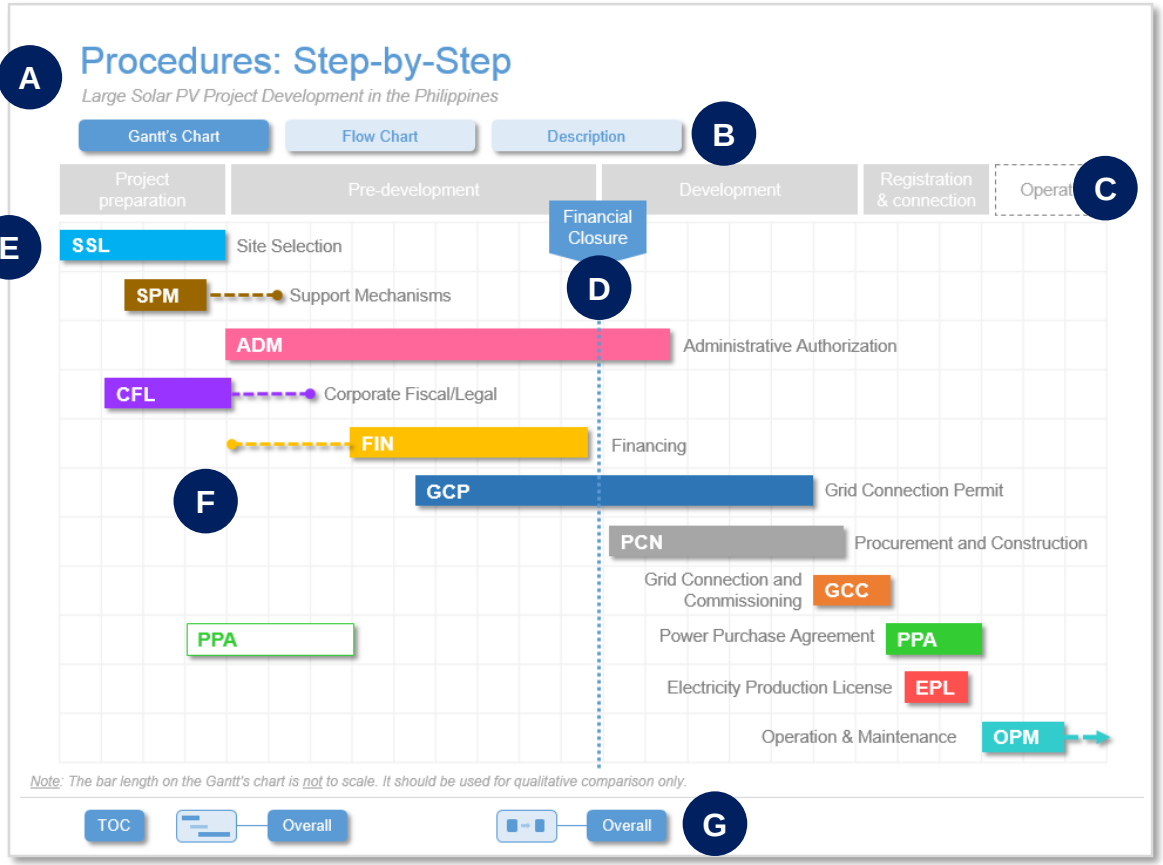
The Gantt's chart is a typical planning tool for project developers. It can show the sequences of steps / sub-steps.

Flow Chart View

The flow chart is a simplified version used to illustrate procedural flow. It can better illustrate the relationship between steps / sub-steps.

How to use the Guideline

Page details – Overall Gantt's Chart



A **Page title and sub-title**

B **Section navigation**

Click these navigational icons to jump directly to the respective sub-section. There are three icons: Gantt's Chart (change to Gantt's chart view); Flow Chart (change to flow chart view), and Description (go to the overall description page). The current page is always highlighted in dark colour

C **Phase of project development**

The typical phase of project development

D **Financial Closure milestone**

The financial closure is an important milestone in RE project development. It is clearly marked on the Gantt's chart and flow chart, allowing for comparisons on the procedure in different countries.

E **Step icon**

Click these coloured icons to jump directly to the respective step

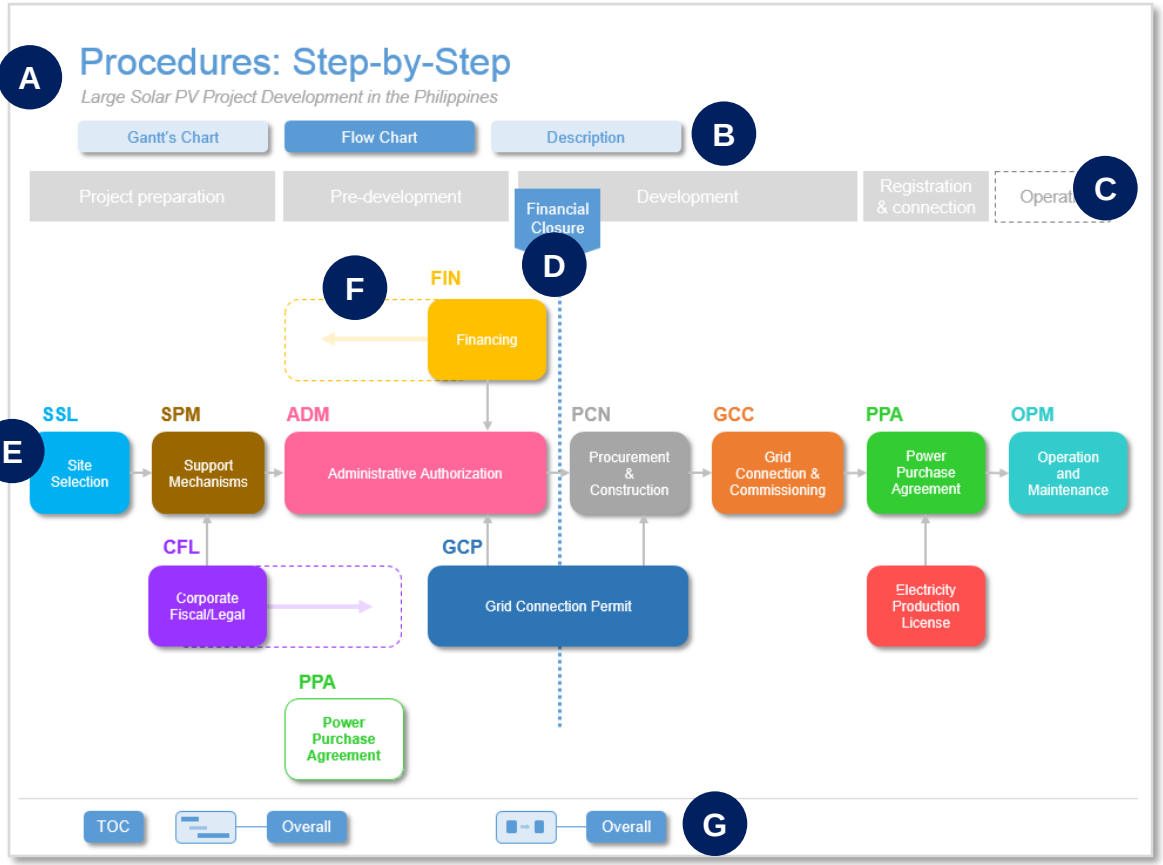
F **Flexibility indication**

Some steps can be done at different times or in parallel. The dotted line represents the flexibility of the step.

G **Main navigation**

How to use the Guideline

Page details – Overall Gantt's Chart



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How to use the Guideline

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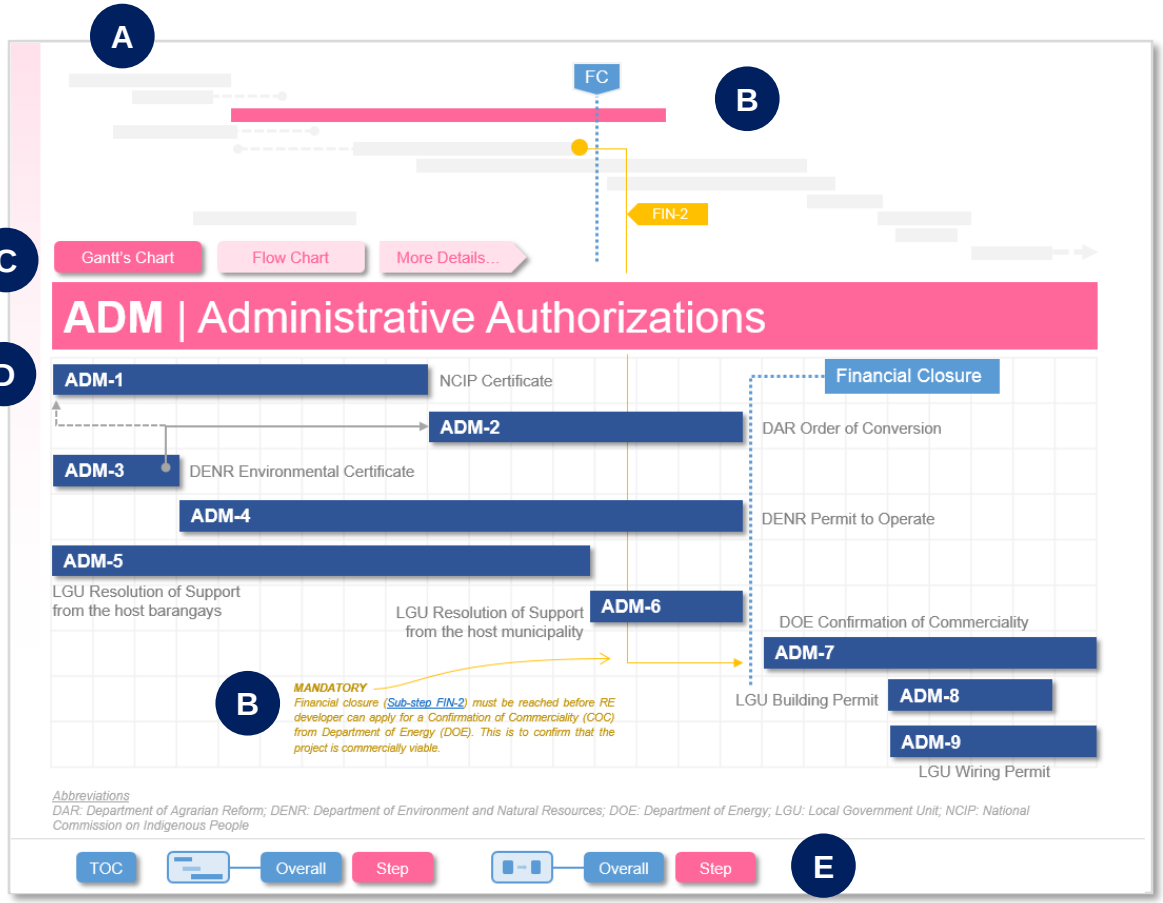


A **Navigation Gantt's chart**

The overall Gantt's chart is shown with the current step highlighted. Click on any Gantt's bar to jump to the respective step.

B **Relationship to other steps**

The relationship of this step to others is shown along with a brief explanation. There are two types of relationships: (1) Recommendation – Based on good practice; and (2) Mandatory relationship – By regulations

C **Section navigation**

Click these navigational icons to jump directly to the respective sub-section. There are three buttons: Gantt's Chart (change to Gantt's chart view); Flow Chart (change to flow chart view), and More Details (go to the detailed description page). The current page is always highlighted in dark colour

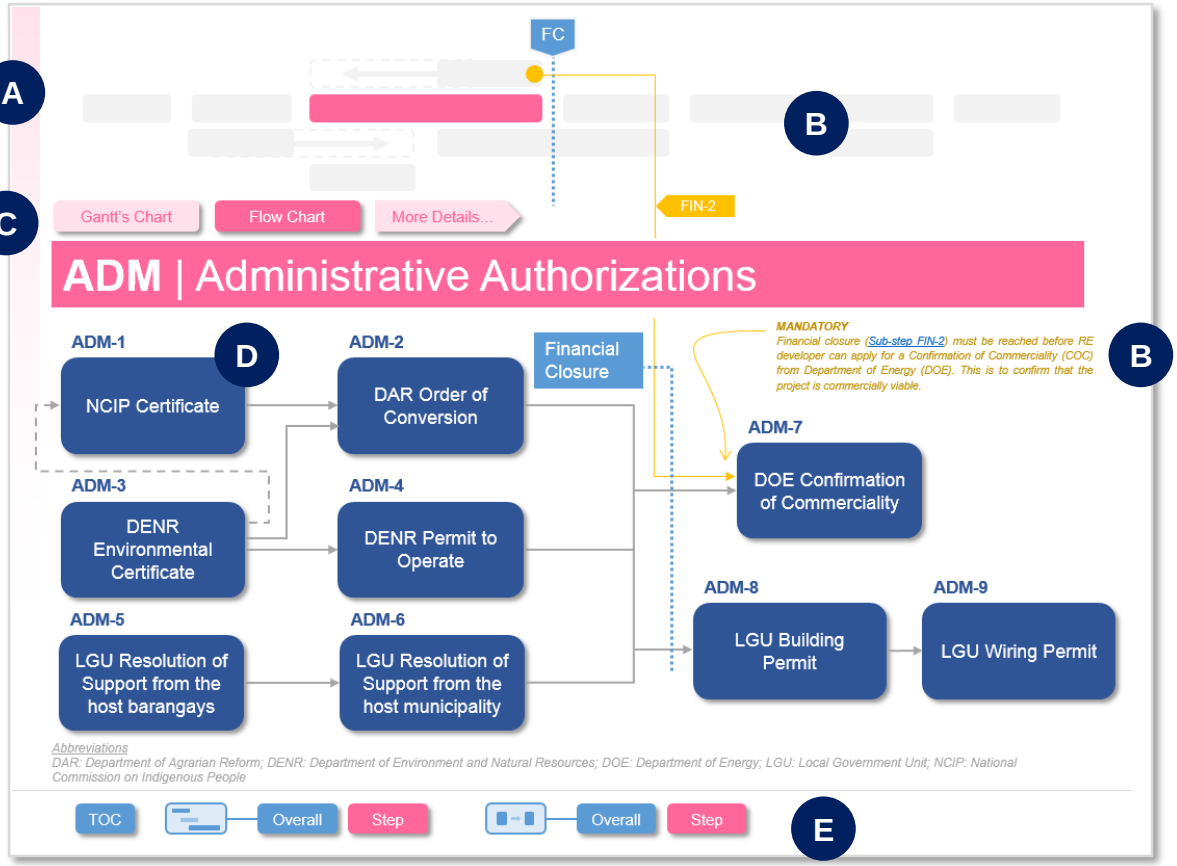
D **Sub-step icon**

Click these coloured icons to jump directly to the respective sub-step

E **Main navigation**

How to use the Guideline

Page details – Step Flow Chart



A **Navigation flow chart**

The overall Gantt's chart is shown with the current step highlighted. Click on any Gantt's bar to jump to the respective step.

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C **Section navigation**

Click these navigational icons to jump directly to the respective sub-section. There are three icons: Gantt's Chart (change to Gantt's chart view); Flow Chart (change to flow chart view), and More Details (go to the detailed description page). The current page is always highlighted in dark colour

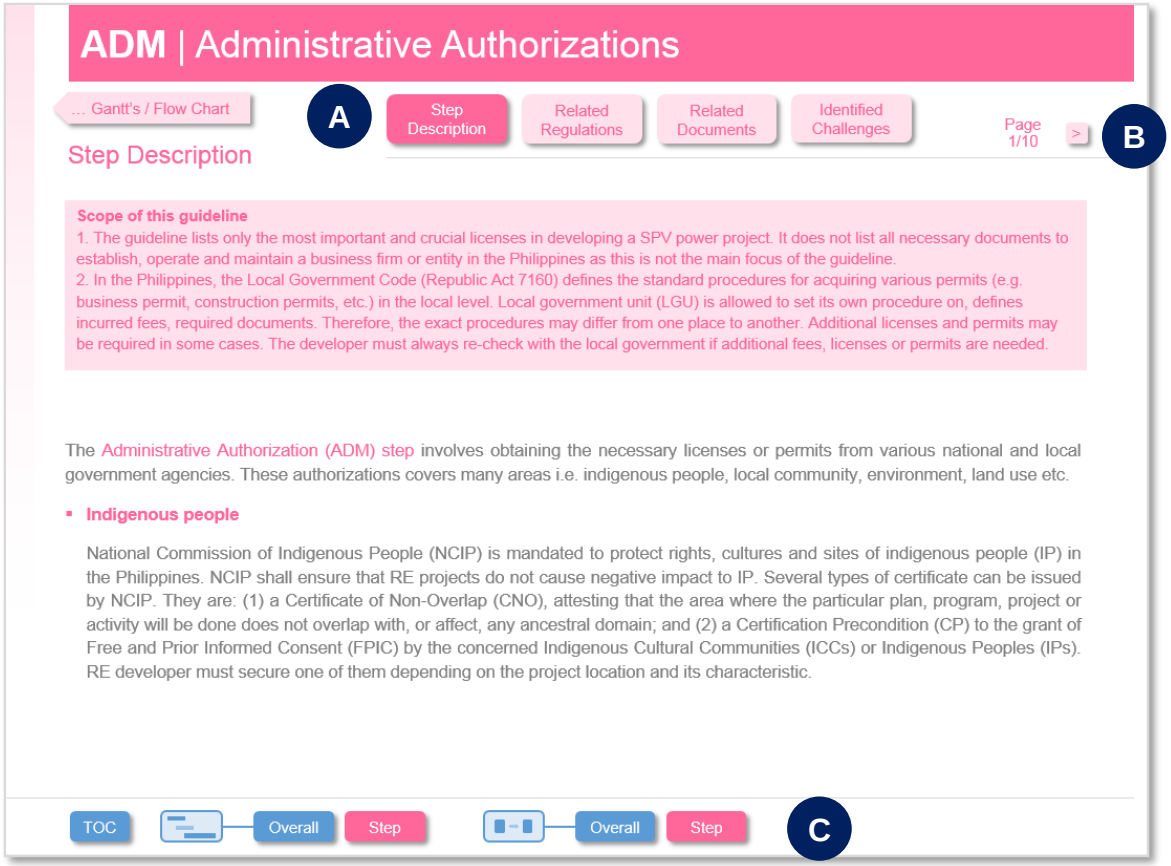
D **Sub-step bar**

Click these coloured icons to jump directly to the respective sub-step

E **Main navigation**

How to use the Guideline

Page details – Step Flow Chart



A **Section navigation**

Click these navigational icons to jump directly to the respective sub-section. There are four icons:
Step description – Click to see explanation of the step
Related regulations – Go to the list of relevant laws or regulations
Related documents – Go to the list of reference documents (not legal documents, e.g., guidebook, study, etc.)
Identified challenges – Go to the list of challenges associated with this step
The current page is always highlighted in dark colour

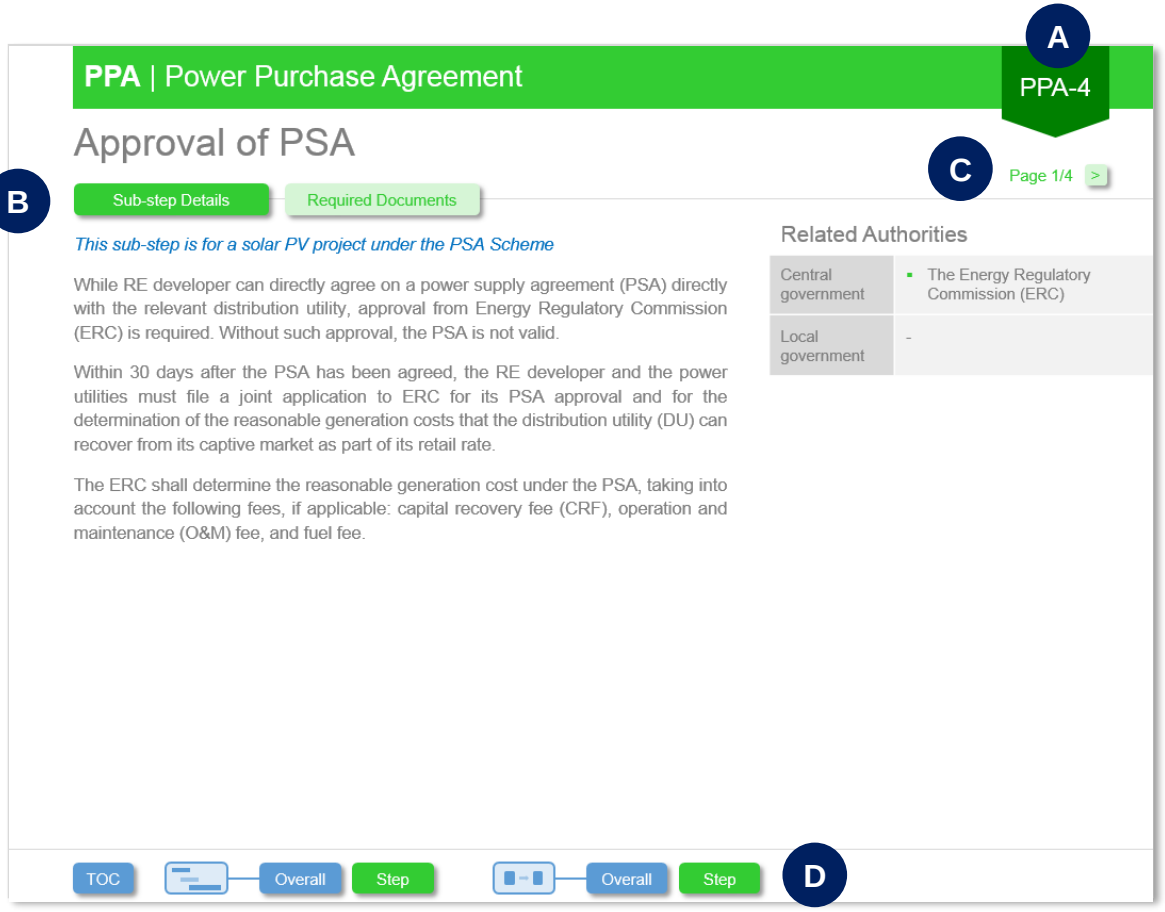
B **Section page**

The current and total number of pages for the section

C **Main navigation**

How to use the Guideline

Page details – Step Flow Chart



A **Sub-step identifier**

The identifier of sub-step for cross-reference purposes. The number doesn't represent the flow sequence.

B **Section navigation**

Click these navigational icons to jump directly to the respective sub-section. In the sub-step level, there is no predefined structure for the sub-section. Each sub-step has different structure. Nevertheless, typical sub-steps consist of three sub-sections::
Sub-step details – Click to see explanation of the sub-step
Required documents– Go to the list of documents RE developer must prepare and submit to authority
Incurred fee – Click to see information regarding regulated fee for each sub-step

C **Section page**

The current and total number of pages for the section

D **Main navigation**

How to use the Guideline

Main Navigation

Main navigation icon (general)

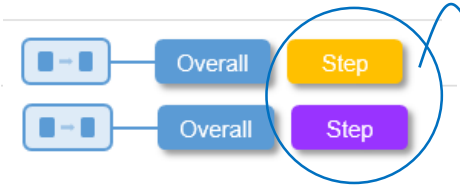
Normally, three navigational icons appear at the bottom of each page

Main navigation icon (in step & sub-step level)

On the pages for the step or sub-step level, two additional coloured icons are present.

*In the Financing (**FIN**) Step…*

*In the Corporate Fiscal / Legal (**CFL**) Step*



The colour varies depending on the current step.

A **Table of Content (TOC)**

Click to go back to the Table of Contents page

B **Overall Gantt's Chart**

Click to go back to the overall Gantt's Chart

C **Overall Flow Chart**

Click to go back to the overall Flow Chart

D **Step Gantt's Chart**

Click to go back to the respective Gantt's Chart of the step. For example, if the current page is part of the Site Selection (SSL) step, this button will lead to the Gantt's chart for the SSL step.

E **Step Flow Chart**

Click to go back to the respective Flow Chart for the step. For example, if the current page is part of the Site Selection (SSL) step, this button will lead to the Gantt's chart for the SSL step.

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< 72 kWp

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